the OIL AND GAS JOURNAL

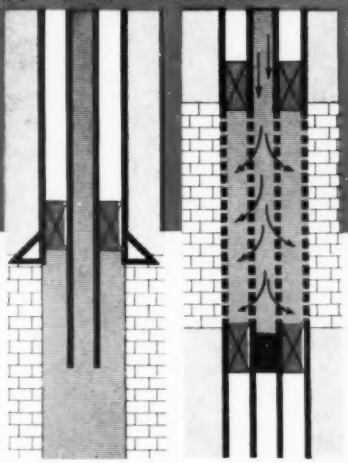
Acidizing Operations

Single Packer Set-up concentrates Acid and Pressure below Packer

For Ordinary service use Lane-Wells BOC packer

For Tough Conditions use Lane-Wells BOD

For *Really* Tough service use Lane-Wells BOE



Two-Packer Set-up confines Acid and Pressure to a Single Zone

For Ordinary service use Lane-Wells BOCU and Lane-Wells BOC

For Extreme conditions use Lane-Wells BODU and BOD or BOE

Ask your Lane-Wells Representative

Lane-Wells Packers have these Important Features

QUICK AND EASY TO RUN • EASY TO PULL • EASY TO SET • POSITIVE PACK-OFF • PACKING ELEMENT WON'T VULCANIZE!

LANE TECHNICAL OIL FIELD SERVICES WELLS

LOS ANGELES • HOUSTON • OKLAHOMA CITY

General Offices, Export Office & Plant

5610 SO. SOTO ST., LOS ANGELES 11, CALIF.

Lane-Wells Service and Products are available thru Petro-Tech Service Co. in Venezuela

AP-20E

PRICE 50 CENTS

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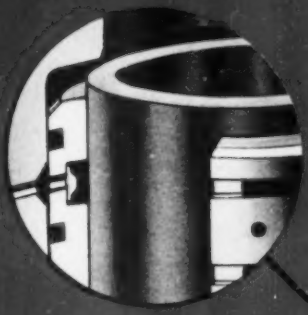
JULY 14, 1949

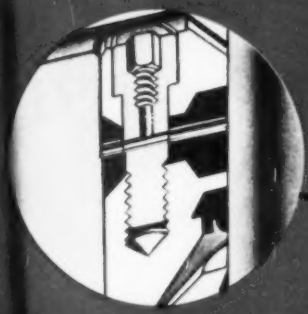
The CAMERON Type "NTXM" Forged Steel Casing Head

TRIPLE-SEALED AND DOUBLE-TESTED

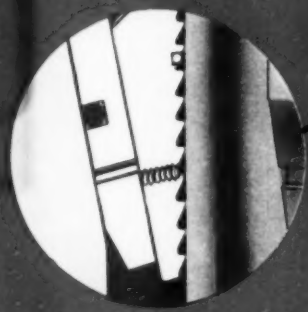
for maximum safety on deep, high pressure wells



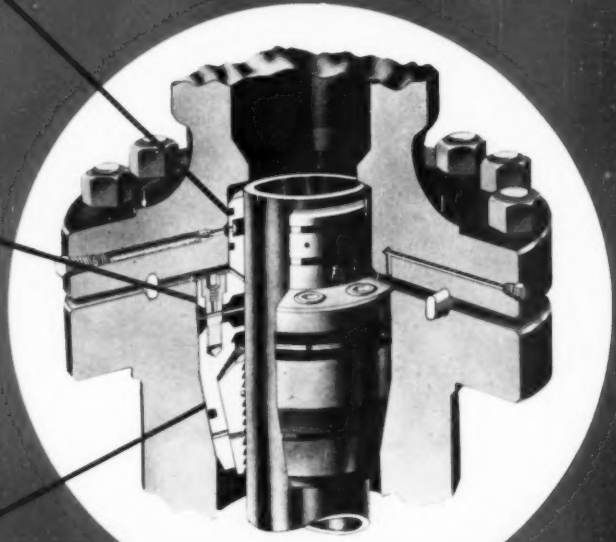
Internally repositable, pre-tested, plastic seal on crossover gland.



Pre-tested resilient seal above slips.



Type "N" slips, with seal ring on slip bowl and lip seal above slips, for temporary but instant seal when setting thru preventers.



TYPE NTXM

Presented above is one of twenty-two interchangeable hanger and seal assemblies for Cameron Forged Steel Casing Heads. This particular assembly combines several proven Cameron casing seals, including the Type "N" seal preparation which has been so widely used in the Cameron Type "N" Test-Weld Flange. This seal may be pressure-tested and repacked at any time during drilling or after the well is completed without disturbing the well head assembly.

The primary casing seal is accomplished by tightening cap screws to expand a resilient seal ring. It may be tested by introducing pressure thru one of the cap screws in which a test port is provided.

A wide selection of interchangeable hangers, from plain "bell-weevil" to the multiple-seal, slip type assembly illustrated, enables the operator to select the suspension and seal best qualified for any specific well condition.

Cameron IRON WORKS, INC.

P. O. BOX 1212 · HOUSTON, TEXAS

Denver: 74 Trinity Place, New York N. Y. Oklahoma: J.H. Thompson Building, Tulsa (Telephone 20978). California: Long Beach (P. O. Box 267). Wyoming: P. O. Box 788, Casper (Telephone 1577). North Louisiana: Bossier City (P. O. Box 425). Texas: Odessa, P. O. Box 451 (Telephone 3112). Corpus Christi (Telephone 28783), Fort Worth (Telephone 44822).

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SPECIFY *LINK-BELT* BALL AND ROLLER BEARINGS

You can *Depend* upon LINK-BELT for:

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3 ECONOMY
4 ACCEPTANCE
5 COMPLETENESS
6 SERVICE

There's no question about the high quality of Link-Belt Ball and Roller Bearings.

Considering the precision manufacturing processes, the skilled use of the most modern equipment under closest control, and the years of scientific research to furnish industry with longer-lasting, more efficient bearings, it is little wonder that "Link-Belt" quality is unquestioned.

Eliminate all guesswork — specify "Link-Belt" on your next bearing order. Choose with the utmost confidence from the COMPLETE Link-Belt line . . . various mountings and sizes for practically all types of industrial applications.

Good supplies of these popular bearings await your commands at distributor's and Link-Belt stockrooms throughout the nation.

11,327

Free Catalogs On Request!

LINK-BELT COMPANY

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LINK-BELT BALL AND ROLLER BEARINGS

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1 Pump...

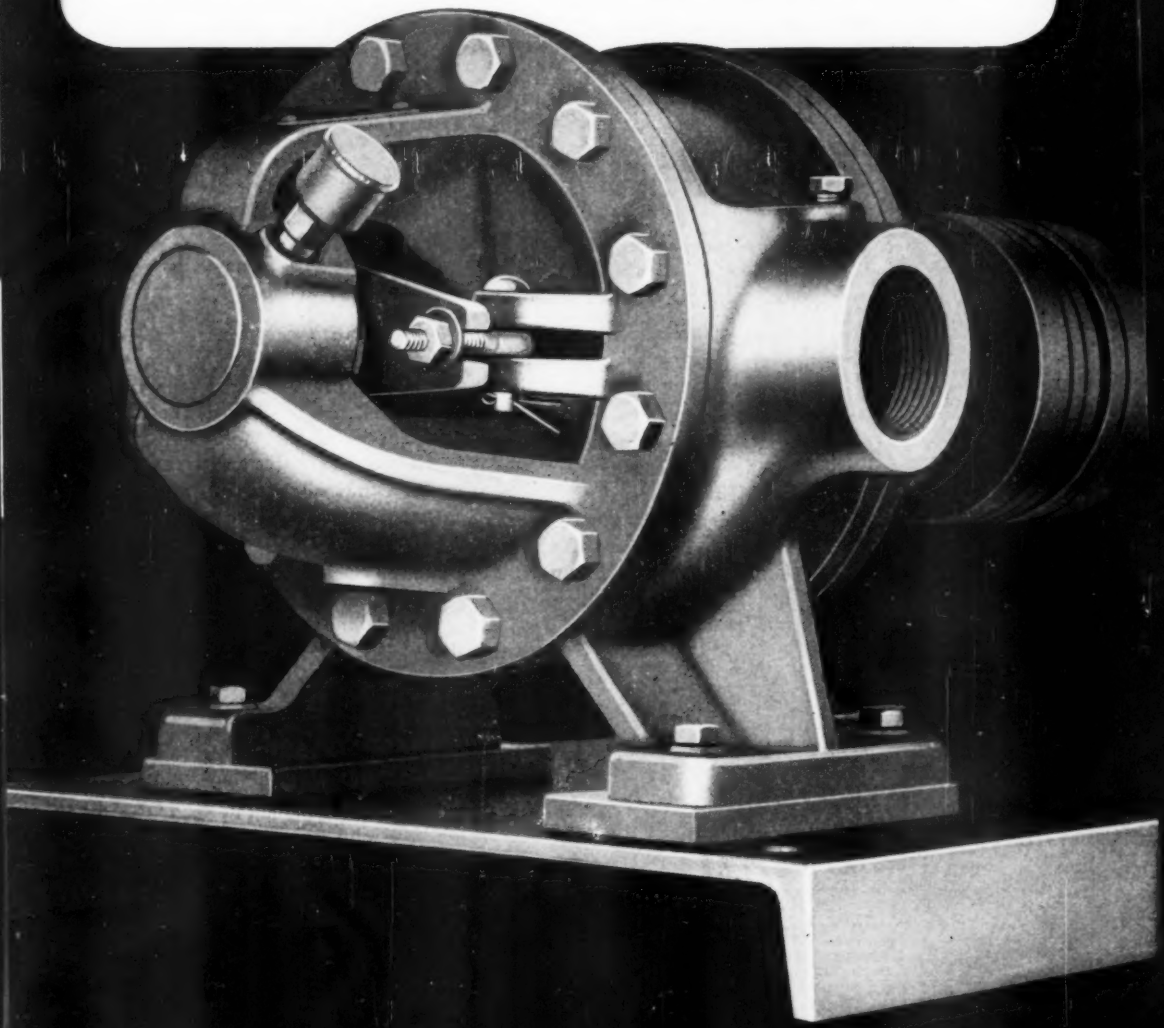
- ... ***that*** gives you multi-stage benefits in a single stage pump.
- ... ***that*** reduces operation and maintenance costs through balanced impeller design and replaceable liners.
- ... ***that*** handles widely varying heads with little loss of capacity and no change in operating speed.
- ... ***that*** handles heads at more than 500 feet at an operating speed of only 1750 r.p.m.
- ... ***that*** minimizes vapor-locking.
- ... ***that*** is available in sizes from 1 to 200 g.p.m.

The Fairbanks-Morse Westco is the ONE pump that gives you all these advantages for lower cost pumping. Ask your Fairbanks-Morse pump distributor or branch pump engineer for the complete story. Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering

OIL FIELD EQUIPMENT • DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS
SCALES • MOTORS • GENERATORS • STOKERS • RAILROAD MOTOR CARS
and STANDPIPES • FARM EQUIPMENT • MAGNETOS



When you clamp a Compass IT STAYS CLAMPED

—for years and years

WANT stretchless, trouble-free belt performance on heavy-duty oil-field drives where Goodyear's famous COMPASS Cord *Endless* belting can't be applied? You can have it — easily.

Merely specify roll-lot COMPASS Oil-Well belting, cut to length, for such drives. Apply it with any standard compression clamp. And that's your guarantee of no more stretch troubles.

Proof? The G.T.M. — Goodyear Technical Man—has followed that procedure on numerous wells. Examples? On a central band-wheel power, a clamped-on COMPASS *is pumping 26 wells!* Another clamped COMPASS has given nine years' service on a heavy beam well. Hundreds of others equally successful — and more are being installed all the time.

There's a reason for this success in handling the heaviest-duty oil-field installations — COMPASS *patented rope-cord body is freer from stretch than any other construction,* even in clamp-fastened applications. You can get cut-length COMPASS in roll lots, in sizes and widths to meet any horsepower requirement.

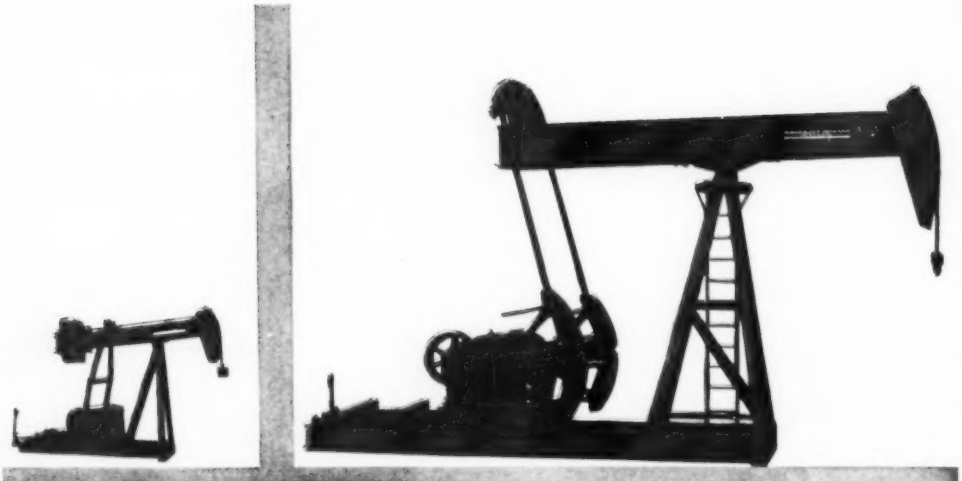
Order from the G.T.M. — or your nearest Goodyear Industrial Rubber Products Distributor. He's your headquarters for hose, belting, molded goods and packing built to the world's highest standard of quality. Or write Goodyear, Akron 16, Ohio.

STANDARD COMPRESSION CLAMP holds this COMPASS belt used to power a central band wheel driving 26 well pumps.

GOODYEAR

THE GREATEST NAME IN RUBBER

Compass—T.M. The Goodyear Tire & Rubber Company



from the husky little T-5 ... *to the big powerful T-27*

AMERICAN Units

... reduce pumping costs

Whether the job is large, small, or in-between, there is an American Pumping Unit the right size to give longer service with less servicing. Various combinations of structures and reducers make available a wide range of Units from which the most economical application can be selected.

American Units are designed to A.P.I. standards. Specify American ... proven by 25 years of service to the oil industry.

Contact your favorite supply store or the nearest American office NOW

25th Year

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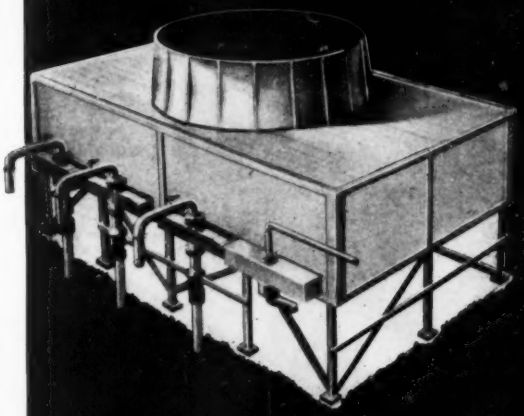
AMERICAN MANUFACTURING COMPANY OF TEXAS

FORT WORTH, TEXAS PHONE 8-2301

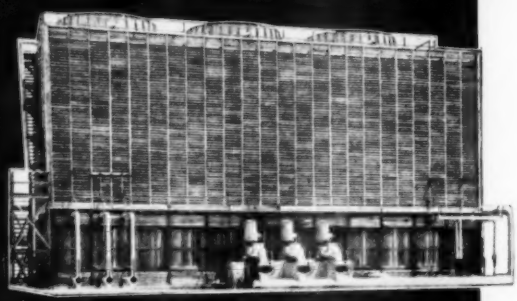
DriCooler*



- Finned tube air cooled units.
- Available with various fin and tube materials, sizes, and designs.
- Sized from small portable field units to large capacity, heavy industrial types.
- Induced or forced draft design with all parts accessible for flexible operation and easy maintenance.
- Structures of all steel or sheet-asbestos covered redwood.
- Marley fans, drive shafts, and Geareducers field proven in over a decade of use.
- Exceptionally low cost . . . guaranteed performance.
- Especially designed for cooling engine jacket water, lube oils, high pressure gases, steam condensing and similar applications.
- Ask for Bulletin DC-49.

*DriCooler is the exclusive trade-mark of The Marley Company, Inc., and is used to designate its finned tube dry surface cooling equipment.

WHICH DO YOU NEED?



Water Cooling Towers

- Complete range of sizes, designs and materials.
- Mechanical Draft or Natural Draft; Cross-Flow or Counter Flow; wood, steel, or transite cased.
- Famous cooling tower trade names such as Aquatower, Double-Flow, Verflow.
- Exclusive Marley-designed, Marley-made fans, drive shafts and Geareducers.
- Accessible parts for flexible operation and easy maintenance.
- Meet every water cooling need with top performance and low cost.
- Available with atmospheric sections for the indirect cooling of fluids.
- Ask for Bulletin G-48.

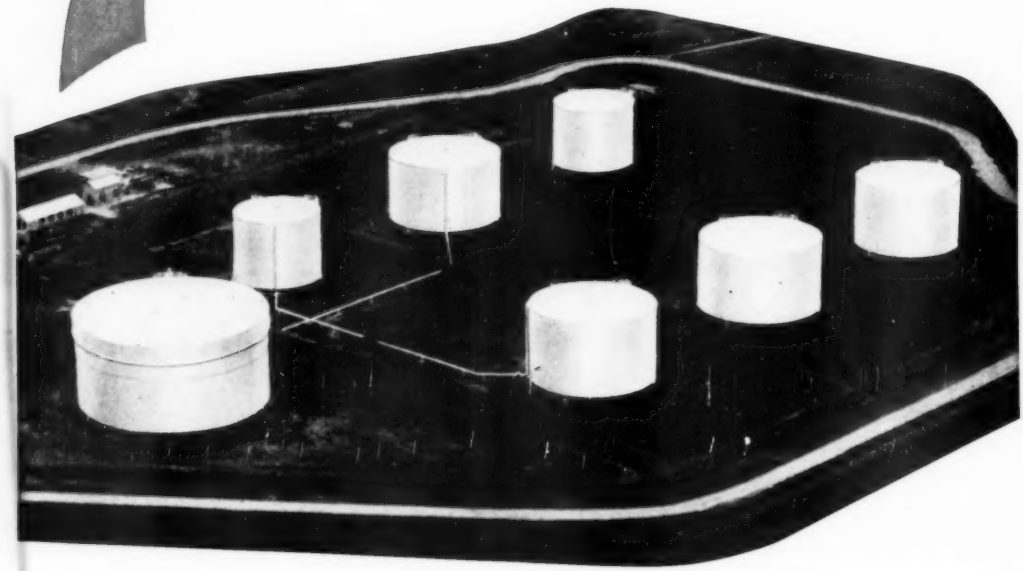
WHY GUESS WHICH IS BEST... Marley designs both, manufactures both, and sells both so a fair and impartial analysis of your cooling problem can be made, based on your needs—not upon the manufacturers ability to supply.

Every day new money-saving applications for both types of equipment are worked out by Marley "double trained" engineers. To keep abreast of the latest developments and to make certain you get the kind of cooling equipment you need ask The Marley Company, Inc., to send a "double trained" Marley application engineer to help you solve your industrial cooling problem. There is no cost or obligation.

MARLEY

THE MARLEY COMPANY, INC. • KANSAS CITY 15, KANSAS

7 POINTS IN FAVOR OF GRAVER EXPANSION ROOF TANKS



Make a point-by-point comparison and you will be convinced that the Graver Expansion Roof Tank is ahead on any score. For example:

■ ***Positive Action*** . . . Patented design permits roof to rise or descend in a straight up and down motion as vapors expand or contract.

■ ***Tank Settlement*** . . . All tanks settle—but the normal unequal settlement will not affect the operation of the Graver Expansion Roof.

■ ***Stabilizer*** . . . Exclusive Graver feature assures peak operating efficiency even with an unbalanced load.

■ ***Maintenance*** . . . Lowest cost—less than any other tank designed for this type of service!

■ ***Liquid Seal*** . . . Protected liquid seal prevents escape of valuable vapors. Nothing to dope or patch; nothing to break, tear, or wear out.

■ ***Gauging*** . . . Because of the straight up and down motion of the Graver roof, gauging of the tank always takes place at the same point and accuracy is assured.

■ ***Multiple Installation*** . . . Where more than one Graver Expansion Roof is required in the same system, the full capacity of every one can be used. No vapors vented till *all* roofs reach full height.

Now . . . get the whole story. Make sure you are familiar with every feature of the Graver Expansion Roof Tank. Ask for full details today.

GRAVER

FABRICATED PLATE DIVISION

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

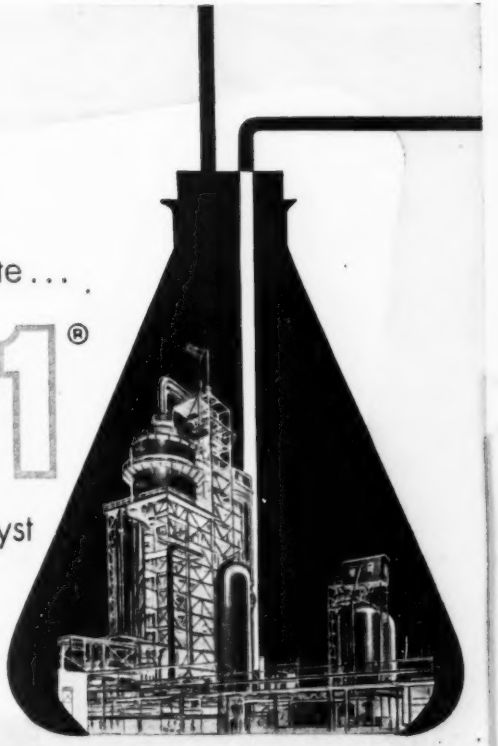
NEW YORK • PHILADELPHIA • CHICAGO • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

WHY

it will pay you to investigate . . .

DAVISON DA-1®

Fluid Synthetic Cracking Catalyst



FACILITIES—Davison is one of the leading producers of fluid synthetic cracking catalyst for the petroleum industry . . .

EXPERIENCE—Davison pioneered the commercial development and production of fluid synthetic cracking catalyst . . .

SERVICE—Davison offers complete laboratory and testing facilities for catalyst evaluation.

Add to these factors the close laboratory control of production to assure consistently high standard of uniform material, and you can see why Davison enjoys the position of catalyst supplier to many of the world's leading refiners. Bringing your catalyst problems to Davison can pay off in time and money.

Write for information and specifications...

DA-1

Davison fluid synthetic silica alumina cracking catalyst is available in three grades . . .

F-1, Fine Grind

C-1, Intermediate Grind

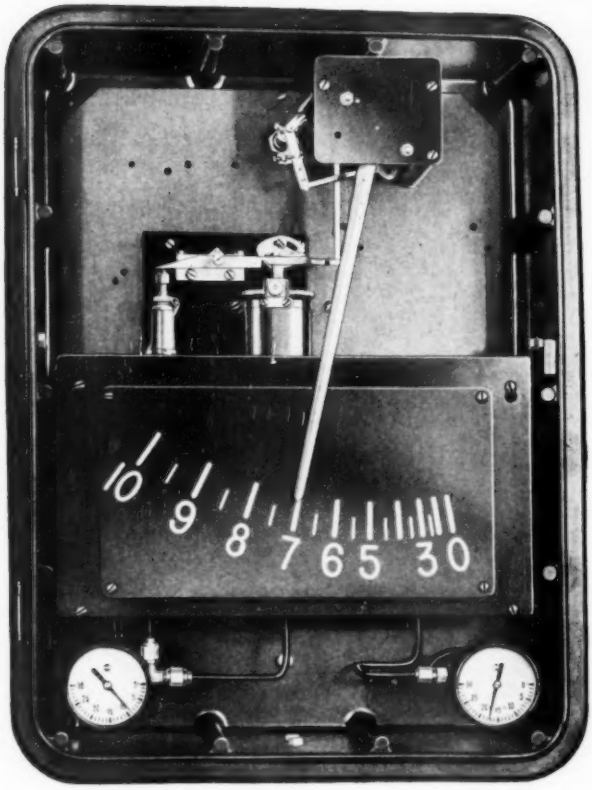
C-2, Coarse Grind

THE DAVISON CHEMICAL CORPORATION

Progress through Chemistry

BALTIMORE-3, MD.

8 STAR SERVICE-FEATURES PNEUMATIC



1. **NO NEED TO BREAK TUBING CONNECTION** for nozzle adjustment.

2. **INSTRUMENT CAN BE REVERSED** by shifting one link without disturbing other adjustments.

3. **LINKAGE ALIGNMENT MADE EASY IN FIELD** with positioning device.

4. **MAXIMUM PROPORTIONAL BAND CHANGES** with minimum output pressure changes.

Many maintenance and servicing problems are answered with completely new design-concepts in this A-88 pneumatic Transmitter and Controller, operating on the standard 3-15 psi air pressure range.

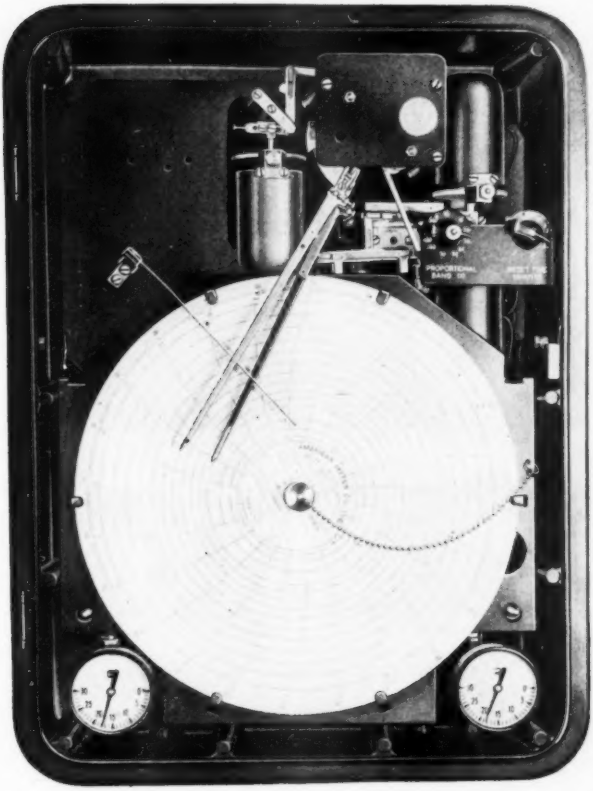
A new minimum of pivot points is achieved through the reduction of moving parts. There is complete accessibility to all adjustments.

These features not only reduce servicing demands and maintenance expense, but contribute greater ease of adaptability to the control of flow, pressure, liquid level, and specific gravity.

The new die-cast aluminum cases may be fitted into the same panel openings provided for many models.

The high degree of interchangeability of parts and sub-assemblies make the new Model A-88 pneumatic Transmitter and Controller readily convertible to changing conditions with a minimum of trouble and expense.

OF THE NEW MODEL A-88 TRANSMITTER AND CONTROLLER



5 **EASY POSITIONING OF NOZZLE** permits widening of proportional band without disconnecting tubing, or disturbing other adjustments.

6 **DAMPENING DEVICE IN RELAY** insures smooth operation.

7 **EASY POSITIONING OF LINKAGE MECHANISM** by means of housed proportioning bellows incorporating knurled wheel (with locking device).

8 **LINEAR ADJUSTMENT** between transmitter and receiver.

FOR COMPLETE INFORMATION

on servicing and operating methods, write for Bulletin CT-49, illustrated to the right.

AMERICAN METER COMPANY
INCORPORATED (ESTABLISHED 1836)

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Atlanta • Baltimore • Birmingham • Boston • Chicago • Dallas
Denver • Erie • Fort Lauderdale • Houston • Joliet • Kansas City
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The 'Jeep' Goes Through Where Others Go Down!

Randall Peters, pipe line gauger Scholem Alechem Field, Stephens City, Oklahoma depends on the 'Jeep' to get around sure and fast. Selective 2- and 4-wheel-drive gives the Universal 'Jeep' speed on the hard roads and ability to go over bad roads or travel cross-country to get right to the job.

Fabric or metal tops optional at extra cost

'Jeep' 4-Wheel-Drive traction is the difference between pulling through and being pulled out . . . between gaining ground and losing time. That is why the Universal 'Jeep' out-performs ordinary vehicles in oil fields everywhere.

The rugged pulling power of all-wheel traction takes the 'Jeep' through the roughest and muddiest oil country —to any location—in all kinds of weather. And the 'Jeep' is built to stand up under the gruelling punishment of day in and day out service.

It will pay you to investigate the time and money saving advantages of the Universal 'Jeep'. Ask your Willys-Overland dealer for a free demonstration.

4-WHEEL-DRIVE UNIVERSAL 'Jeep'

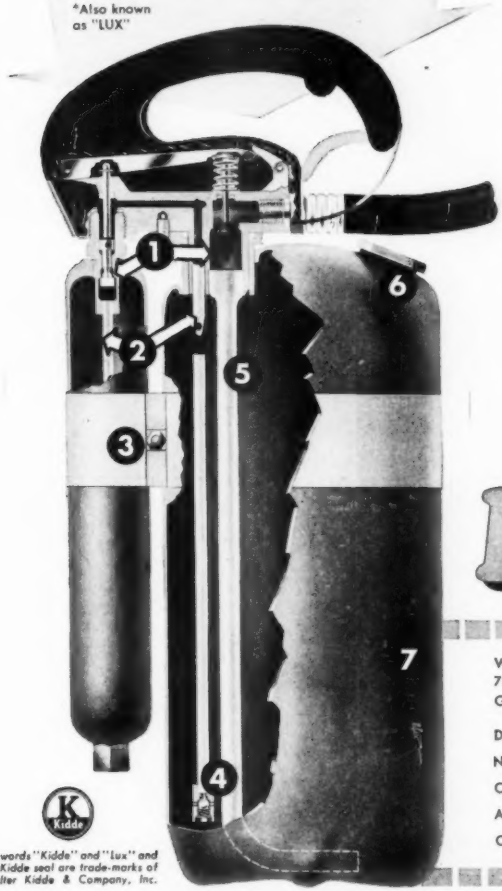
WILLYS-OVERLAND MOTORS, TOLEDO 1, OHIO • MAKERS OF AMERICA'S MOST USEFUL VEHICLES

A New DRY CHEMICAL EXTINGUISHER WITH Trigger-Finger Control

(nothing new to learn)

Here, at last, is an extinguisher that's designed *right* to make the most effective use of an effective fire-extinguishing agent. *Kidde* Dry Chemical Extinguishers—made in 20- and 30-pound capacities—are operated simply by pulling a trigger—the same familiar, time-tested method used on all *Kidde** carbon dioxide (CO_2) extinguishers.

*Also known as "LUX"



The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

PLUS these 10 other big features

1 *Simultaneous opening of CO_2 and powder valves.* No trapping of gas pressure in powder chamber *before* the discharge starts.

2 *Quicker transfer of pressure to powder chamber.* Siphon tube carries CO_2 to outlet in powder chamber, where it expands to a gas.

3 *CO_2 cartridge easily replaced.* Just loosen name band holding cartridge—then unscrew cartridge. Same size cartridge for both 20- and 30-pound extinguishers.

4 *CO_2 fluffs up powder—prevents packing.* Small port at bottom of CO_2 outlet tube allows gas to stir up powder.

5 *Powder discharges from top through siphon.* No danger of packing at hose connection.

6 *Powder filler cap needs no tools.* Unscrews easily for refilling of extinguishers in the field. Filler cap is safety-vented.

7 *Lightweight cylinder for ease of carrying.* Pound for pound, the *Kidde* Dry Chemical Extinguisher packs more fire-fighting punch!

8 *Better powder dispersion pattern.* Diffusion baffle in horn gives greater coverage, more effective application. No shut-off valve in horn to trap powder under pressure in hose. No rodding out of hose after use.

9 *Extinguisher tested for operation at* −40°F.

10 *Improved powder and packaging.* Powder specially processed to make it free-flowing; packed in weatherproof containers. 30-pound carton contains three 10-pound cans—for easy refilling of either 20- or 30-pound extinguishers. 50-pound containers also available.

Walter Kidde & Company, Inc.
754 Main Street, Belleville 9, N. J.

Kidde

Mail the coupon for full information.

Walter Kidde & Company, Inc.
754 Main Street, Belleville 9, N. J.

Gentlemen:

Please send me further information on the *Kidde* Dry Chemical Extinguisher.

Name.....

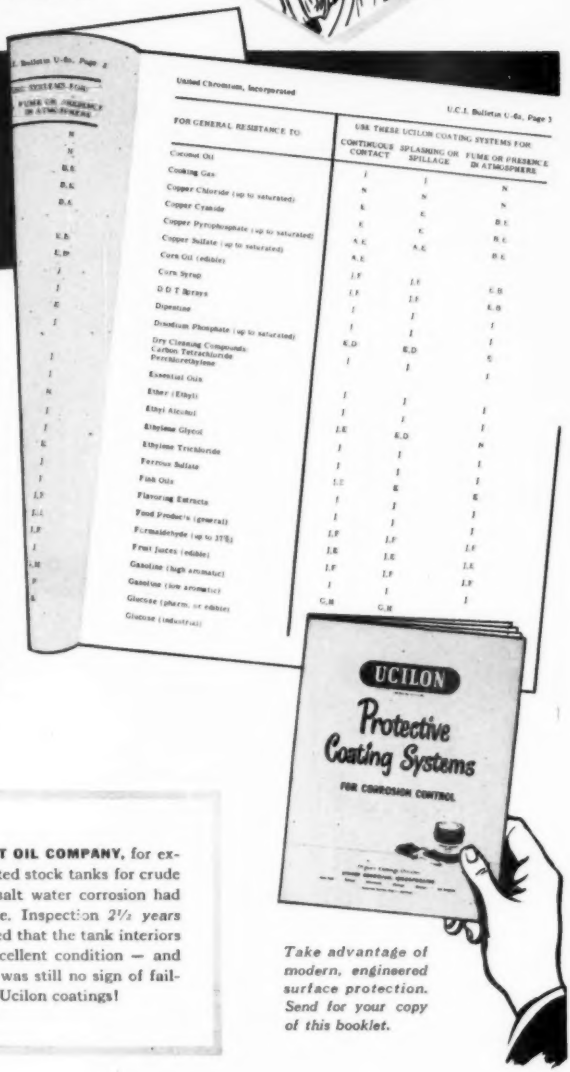
Company.....

Address.....

City.....State.....

Are your CORROSION troubles listed here?

Control them systematically with UCILON Protective Coatings and the help of this booklet

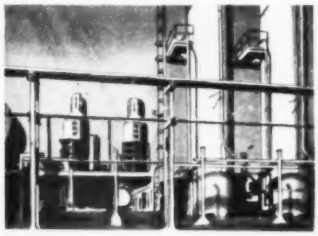


Users of Ucilon coatings are acclaiming this systematic method for controlling corrosion as they report getting longer life from equipment plus lower maintenance costs. It may be the practical answer to your own problem.

First, we send you this 32-page booklet. It lists common agents responsible for failures of ordinary paints and the subsequent corrosion of equipment. For each of the 153 agents listed, it presents a recommended system of Ucilon protective coatings for use against the specific trouble—one which has proved it can lick the corrosion problem to a "standstill." There are systems that resist acids, alkalies, salts, oils, water, organic materials.

You choose the best system for your application, and by so doing you automatically select the required coatings from the complete Ucilon line. Then follow the complete instructions for carrying out the system.

See what a big difference such a systematic approach to corrosion control can make in your plant. You'll learn why Ucilon Systems succeed so often where other coatings fail.



A MIDWEST OIL COMPANY, for example, coated stock tanks for crude oil where salt water corrosion had been severe. Inspection *2½ years* later showed that the tank interiors were in excellent condition — and that there was still no sign of failure in the Ucilon coatings!

Take advantage of modern, engineered surface protection. Send for your copy of this booklet.

UCILON Protective Coatings

Reg. U.S. Pat. Off.

UNICHROME products of UNITED CHROMIUM, INCORPORATED

51 East 42nd St., New York 17, N. Y. • Detroit 7, Mich. • Waterbury 90, Conn. • Chicago 4, Ill. • Dayton 2, Ohio • Los Angeles 13, Cal.

If your drilling conditions and your pump pressures justify JET BITS-

HUNT HAS THEM!

HUNT JET BITS in all sizes.... with or without Dull Bit Indicators

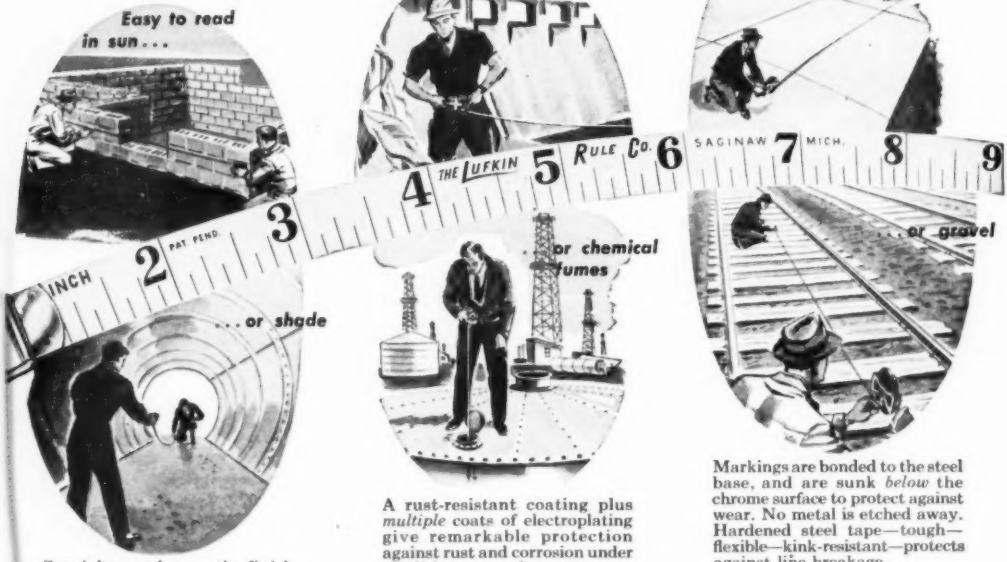
HT-3000

HUNT TOOL COMPANY

GENERAL OFFICES AND PLANT: HOUSTON, TEXAS
FIELD SHOPS: BAY CITY & CORPUS CHRISTI, TEXAS; JENNINGS & HARVEY, LA.
EXPORT SALES: HUNT EXPORT COMPANY, 19 RECTOR ST., NEW YORK; HOUSTON, TEXAS; BUENOS AIRES; PORT OF SPAIN; CARACAS

A BUSINESS BUILT ON *Good* SERVICE

CHROME CLAD TAPES do what no other tapes can do!



Special non-glare satin finish on heavy chrome plating that adds to toughness of the line. Durable jet-black markings stand out sharply against this light-absorbing surface. Will not crack, chip or peel.

A rust-resistant coating plus *multiple* coats of electroplating give remarkable protection against rust and corrosion under conditions no other tapes can withstand.

Markings are bonded to the steel base, and are sunk *below* the chrome surface to protect against wear. No metal is etched away. Hardened steel tape—tough—flexible—kink-resistant—protects against line breakage.

LUFKIN CHROME CLAD STEEL TAPES

DIAGRAMMATIC CROSS-SECTION VIEW

1. Hardened Steel Tape. 2. Rust-Resistant Coating. 3. Multiple Coats of Electroplating. 4. Hard, Smooth, Non-Glare Chrome-Plating. 5. Black Markings Bonded to Steel, Sunk below Surface.

The news is spreading fast. Wherever men use steel tapes they are talking about these outstanding improvements found only in Lufkin "Chrome Clad Tapes."

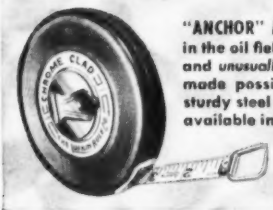
Surveyors—mill men—carpenters—men everywhere who work in extremes of light and shade say "Chrome Clad Steel Tapes" mean less stooping and squinting—easier reading—less chance of errors—faster work.

Construction and road crews marvel at the way they resist kinking and line breakage—saving valuable time and repair expense. They find the markings still sharp—easy to read—after years of rough usage.

Men of the oil fields, mines, chemical plants, and waterways state that "Chrome Clad Steel Tapes" resist rust and corrosion in dampness, fumes and sea water as no other tapes can do.

If you want the satisfaction of owning the "Outstanding Tape of Today," call for Lufkin "Chrome Clad Steel Tapes" at your dealers.

***Buy* steel tapes with easy-to-read markings that are durable**



"ANCHOR" Model . . . Preferred for heavy duty in the oil fields because of its greater durability and *unusually* large, easy-to-read figures, both made possible by the full ½" width of the sturdy steel line. Permanent jet black markings available in either the English or Metric system —or both. Hand-stitched genuine leather case protects rust resistant steel liner.

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PRECISION TOOLS • TAPES • RULES
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THE LUFKIN RULE CO.
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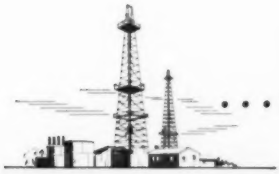
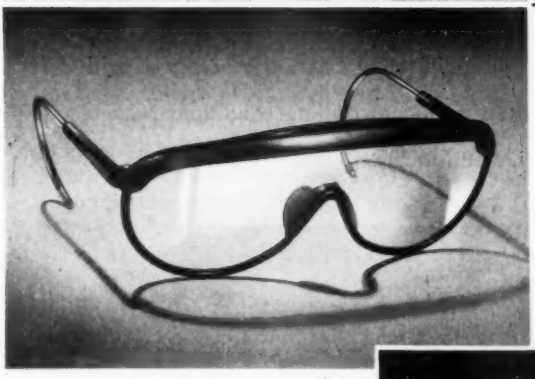
AO LIGHT-WEIGHT Goggles

Oilmen Use Them for Glare and Impact Protection



. . . and they get a bonus in Looks!

AO F9249G ACETATE GOGGLE — One of the F9200 series of lightweight Ful-Vue acetate goggles, this model is of green acetate with 6 Curve Super Armorplate Calobar lenses. It offers good looking, strong and durable protection against both hazards from flying particles and sun, heat, ultraviolet and infrared radiations. Side shields protect against particles, cinders and dusts striking laterally. High set end pieces take hinges and temples out of line of sight for UNOBSTRUCTED VISION . . . comfort cable temples provide snug fit . . . nose pads distribute goggle weight evenly for unusual comfort.

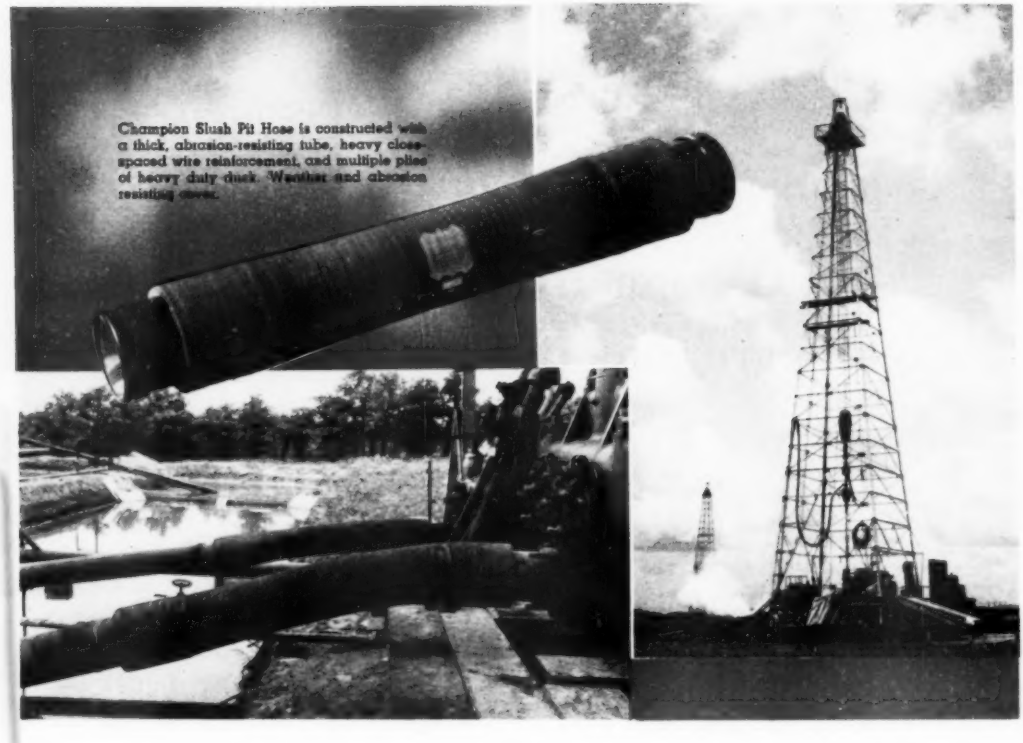


AO 607 PLASTIC GOGGLE — Here's an even lighter goggle that combines utility with smart, good looks! *It can be worn directly over the eyes or over spectacles.* Large shatter-resistant single acetate lens provides wide angle vision and is easily replaceable. Clear or green lenses available. Frame is of lightweight durable plastic, face-formed for extra safety and appearance. Comfort cable temples adjust quickly and easily.

Your AO Safety Products Representative can supply you with the goggle to meet your needs

American Optical COMPANY
Safety Products Division

Southbridge, Massachusetts • Branches in Principal Cities


Champion Slush Pit Hose is constructed with a thick, abrasion-resisting tube, heavy close-spaced wire reinforcement, and multiple plies of heavy duty duck. Weather and abrasion resisting cover.

Champion Slush Pit Suction Hose for dependable oil well drilling

Champion Slush Pit Suction Hose pays for itself many times over by increasing pump life and reducing maintenance costs and down-time. Champion qualities have been proven in thorough-going tests on all types of drilling equipment and under the toughest of modern drilling conditions. Get in touch with your distributor for detailed information.

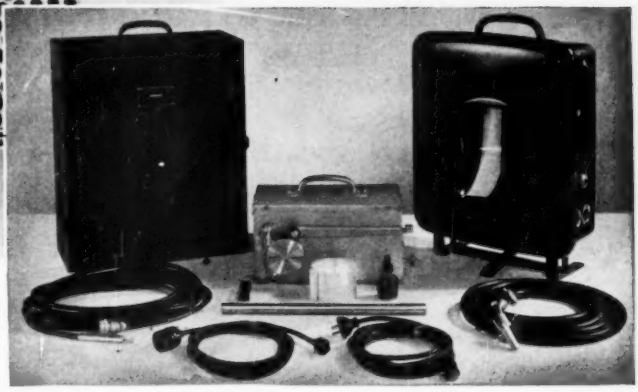
MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION . . YOUNGSTOWN, OHIO
Lee Deluxe Tires & Tubes . . Conshohocken, Pa.

FIGURE 2

New simple probe insertion with compressed air makes the use of Probolog a one man job . . . greatly speeds up tube checks.

Now! Faster PROBOLOG checks heat exchanger tubes



Improved– HIGHER PROBE SPEED

Improved– MULTI-PURPOSE PROBES

Improved– SIMPLE, PRECISE CONTROL SETTINGS

Probolog is the much-discussed electronic instrument which makes visible, permanent records of the condition of individual, nonmagnetic tubes in heat exchangers and other tubular equipment.

After several years of commercial service, Probolog has earned a unique record of reduced maintenance costs, of unfailing accuracy and safety in the inspection of tubular equipment.

Shell has now added several improvements to the original Probolog, making it even more precise, more versatile and easier to use.

A new booklet contains a comprehensive description of Probolog and its operation. Please use the coupon. Demonstration can be arranged.

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50 West 50th Street, New York 20, New York

Please send me a copy of "The Probolog."

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Company_____

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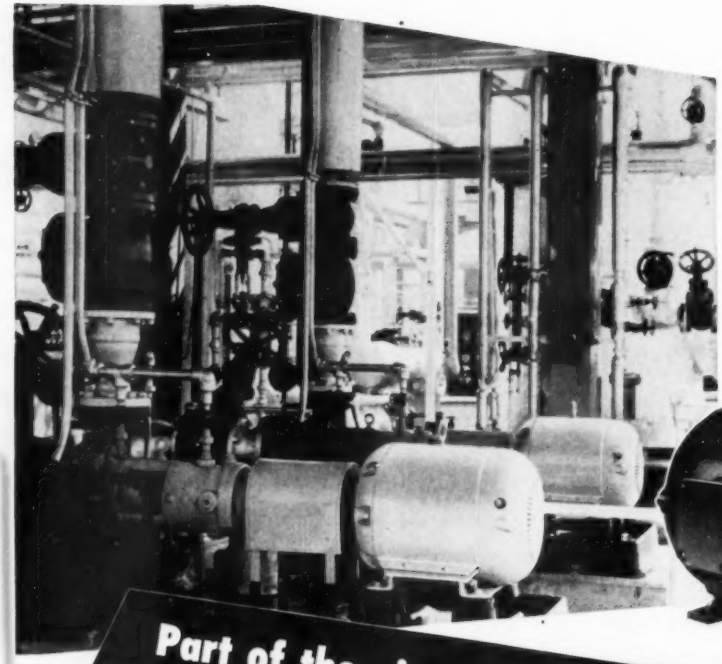
SHELL



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Explosion-Proof MOTORS...

Part of the picture... Where Safety Counts

You'll find thousands of Wagner type HP Motors on the job in the petroleum industry. There's a mighty good reason—the Wagner type HP Explosion-Proof Motor is specifically designed to operate economically and *safely* in surroundings where open type motors are hazardous. It has been fully tested and approved by Underwriters' Laboratories for Class I Group D hazardous locations.

But meeting Underwriters' standards is not the only factor considered in the building of these motors—they are designed by Wagner to give many years of dependable, troublefree service under the most severe operating conditions.

If the atmosphere in your plant contains explosive gases, fumes, vapors or combustible substances, investigate the safety and long service qualities of Wagner type HP Motors.

Twenty-nine branch offices, located in principal cities, are ready to help you whenever you have a motor problem. Users of Wagner Motors also profit by nationwide service facilities. Write for Bulletin MU-185 for information on the complete line of Wagner Motors.

Wagner Electric Corporation

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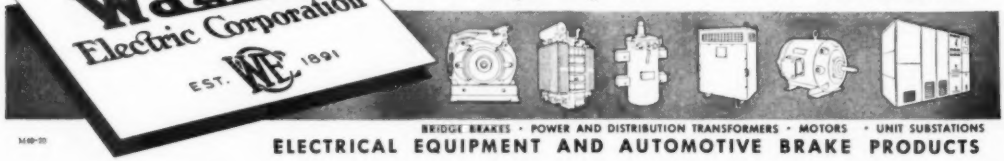
Consult Wagner Engineers on all Electric Motor Problems



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Almost everything used by the oil industry is available thru your Jones & Laughlin Supply store. Stocks are "tailored" to the problems of the areas served, and top quality is a *must*. Regardless of your branch of the industry, you'll find this one-stop service more convenient, more economical, and more efficient. Try it. Use the phone if you wish.

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Patterson-Ballagh pipe wipers give...

wear resistance...

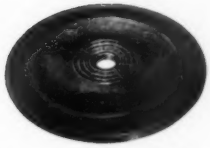
tear resistance...

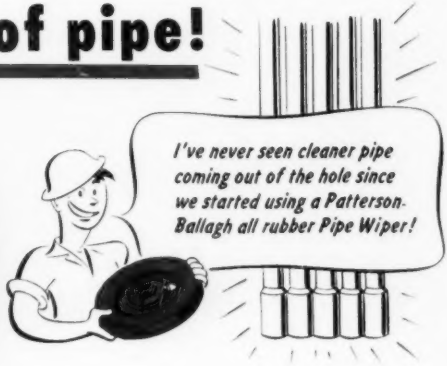
a clean string of pipe!

TANDEM

STANDARD

WINDOW





The TANDEM – made of tough wearing interchangeable halves held together with tapered self-locking rubber pins – efficiently wipes pipe, with flexible, positive action. Even when the operator is using oversize tool joints, which require oversize protectors, the TANDEM Pipe Wiper allows these to pass with minimum effort. Eight new rubber pins come with each replacement half.

Patterson-Ballagh Pipe Wipers are available in several single styles for regular and special oilfield uses. See any one of our field representatives, or send for your copy of the descriptive Patterson-Ballagh Catalog.

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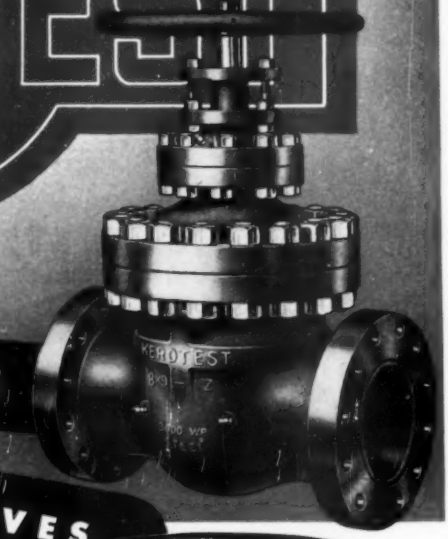
PRECISION ENGINEERED
Cast Steel

FLOW LINE and
DRILLING VALVES



KEROTEST developed the *first* cast steel gate valve adopted by the oil industry and today, more than ever, offers you the latest developments in precision-engineered cast steel valves for every oil field need. KEROTEST Valves meet every requirement from the day you spud-in . . . to production . . . to distribution manifold . . . pipe line . . . and refinery. Call in your local Kerotest engineer on your *next* operation.

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KEROTEST

America's First Name in Quality Valves . . . .

There's good news in this important

Announcement

about

"MONEL" Heat Exchanger Tubing

Now you can get Monel* heat exchanger tubing—*at once!*

There is a stock of ¾" OD x 0.065" and 0.083" wall x 16' long Monel tubing in the Houston warehouse of METAL GOODS CORPORATION.

Orders are now being accepted by Distributors (see complete listing at left) for *immediate shipment* from warehouse stock.

This means you can quickly put Monel heat exchanger tubing to work in all those places where corrosive conditions are causing delay, expense or shut-down.

Monel brings you high resistance to the destructive attacks of such corrosives as hydrogen sulfide, hydrochloric acid, sulfuric acid, and brine.

Monel also withstands hydrofluoric acid in HF alkylation, and serves dependably under high temperature, high pressure conditions in feed water heaters. It stands up in caustic soda reboilers and in condensers for chlorinated solvents and furfural.

In condenser tubes where it meets impure or brackish waters at high velocity, Monel resists the effects of cavitation and impingement.

And here's something else. Monel is strong and tough, yet it can be readily fabricated, welded and machined. No after-treatment is needed to develop maximum corrosion resistance.

For all refinery tubing applications that demand exceptional corrosion resistance *plus* strength and toughness, remember Monel. And remember, too, that you can get Monel heat exchanger tubing right away. *No waiting!* Write, wire or phone your nearest Distributor—today!

*Reg. U. S. Pat. Off.

Call your nearest Distributor!

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WHITEHEAD METAL PRODUCTS CO., INC.
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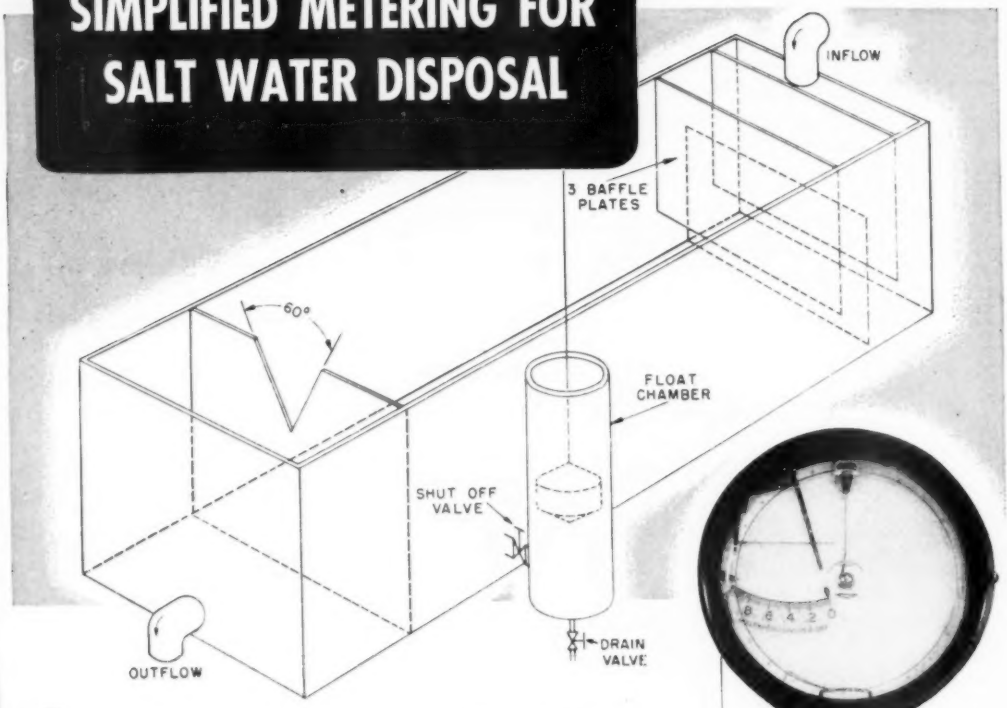
THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

SIMPLIFIED METERING FOR SALT WATER DISPOSAL



THE easily-constructed, highly-accurate V-Notch Weir combined with the *direct-flow-reading* Foxboro Weir Meter is widely accepted by oil operators as the simplest, most accurate means of metering salt water disposal. It provides valuable, ready-to-use records for estimating costs, checking services, and following operations . . . gives you direct readings in UNITS OF FLOW to save time and avoid errors.

The Foxboro Weir Meter, like the V-Notch Weir, is highly regarded for its simple, rugged construction and dependable accuracy. For example, you'll find the recorder mechanism *free from gear trains and multiplying linkage*. The vertical motion of the float is converted directly to a uniform scale flow measurement through a bakelite cam mounted on the cable drum shaft. The cam is cut from a master metal template to tool-making precision. A hardened stainless steel follower, linked directly to the pen-arm, is designed to assure against appreciable change in accuracy regardless of wear.

Other features of this Foxboro Weir Meter include micrometer zero adjustment on cable drum; positive protection against overrange; weatherproof case; corrosion-free float, cable and mechanism, and a direct-reading integrator for total flow.

All these features are fully described in Bulletin 298-1. Engineers will be interested in our flow and capacity curves on flumes and weirs. Write the **Foxboro Co., 60 Neponset Avenue, Foxboro, Mass., U. S. A.**

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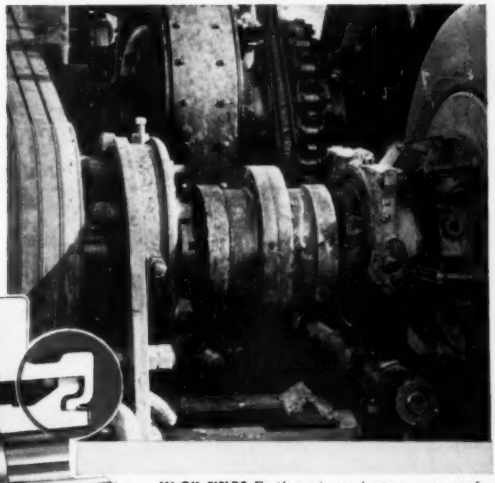
INSTRUMENTS FOR OIL PRODUCTION

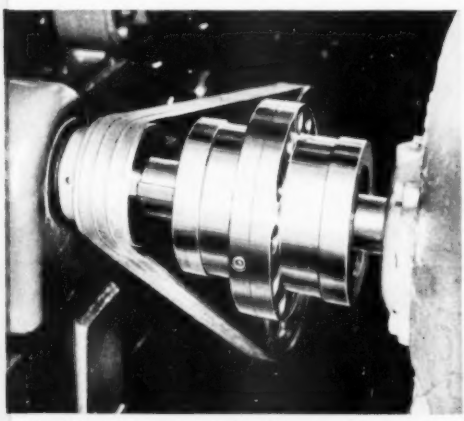
Here's Freedom from *Coupling Shutdowns* for ALL INDUSTRIES



IN OIL FIELDS Fast's are in service to compensate for shaft misalignment, in all kinds of weather, subject to moisture, dirt and grit . . . yet they transmit power without costly coupling shutdowns!

Here's the *exclusive* "rocking bearing," heart of *dependable* Fast's Couplings.

CHEMICAL PROCESSING plants use Fast's Couplings because *exclusive* metal-to-metal seal keeps out impurities—eliminates lost time due to coupling failure! These Couplings have been in service since 1922!



MANUFACTURING processes of all kinds throughout industry demand *dependable* Fast's Couplings that *do not break down* under severe conditions!

NO matter what you make—no matter how much horsepower you use in a year—Fast's Couplings virtually eliminate all coupling failure in your plant! There are *no perishable parts* to wear or fail in Fast's! Nothing to replace . . . they're easy to maintain. Even the load-carrying oil is *completely guarded* by a positive metal-to-metal seal formed by exclusive "rocking bearing" principle of construction.

With Fast's on your job you can forget about coupling shutdowns. Correctly engineered position of oil-protecting "rocking bearing" allows for *freedom of movement* to compensate for misalignment because its *spherical base* has *the same axis* as the hub spline faces. No perishable packing rings are used at this critical spot . . . or elsewhere!

When you order Fast's you get years of top engineering experience, Koppers' high standards of workmanship and unexcelled service, including available parts if required by change of drive, *even if your Fast's have been running for 30 years!* For full information mail the coupon below. Address Koppers Co., Inc., Fast's Coupling Dept., 227 Scott Street, Baltimore 3, Md.

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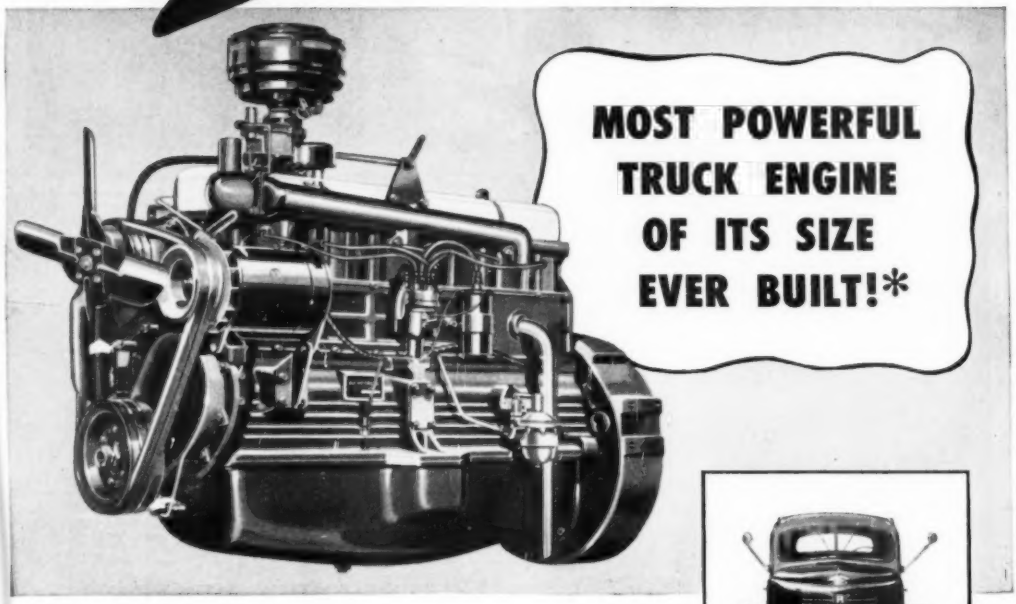
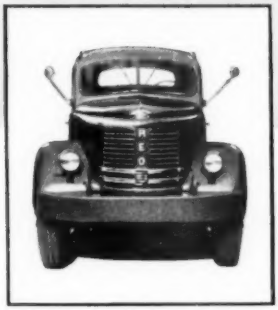
Announcing REO GOLD COMET POWER





Reo Model E-22 series is powered by the new Reo-built Gold Comet! Modern styling, increased driver comfort——and Reo's exclusive "More-Load" design. 17,000 lbs. to 38,000 lbs., G.V.W.

YEARS of research and testing—$5,000,000 in experimental work and ultramodern precision machinery—have produced Reo Gold Comet Power.

A six-cylinder, overhead-valve, gasoline engine with "wet sleeve", removable cylinders, the all-new Reo Gold Comet engine will set *entirely new standards* for truck performance . . . under all operating conditions. The Reo Gold Comet has been built to move payloads faster, more often, at lower cost, and with an *unlimited life span* that only lack of normal care and maintenance can shorten.

***The new Reo Gold Comet engine (331-cubic-inch displacement) develops more *usable* horsepower and torque than any other six- or eight-cylinder gasoline truck engine of comparable displacement. See your Reo dealer for full information and demonstration.**

YOU NAME THE TEST!

Reo has a model *right* for you. Ratings range from 8,000 lbs., G.V.W., to 76,000 lbs., G.V.W. *You name the test!* Your Reo dealer will show you how Reo trucks can beat the best performance of any truck you now own. Reo Motors, Inc., Lansing 20, Michigan.

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Why invest in an expensive inventory to speculate on your replacement needs or additional requirements . . . when you can depend upon Metal Goods for swift delivery? We carry your stock and anticipate your requirements.

Your nearby Metal Goods Warehouse stocks many *valves, fittings and accessories of Stainless Steel, Monel, Nickel Alloys, Everdur and Brass.*

Standard and special sizes and types that meet API-ASME and ASME requirements. You'll always save time as well as inventory expense by depending upon your Metal Goods warehouse for all of your fittings. Your Metal Goods man will be glad to help you with your valve and fittings problems.

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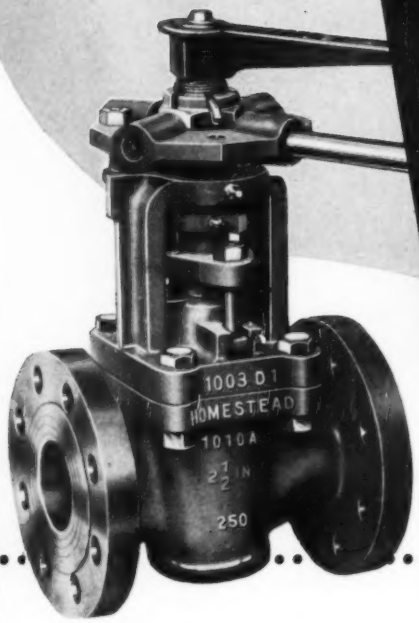
~~Corrosion~~...~~Temperature~~...~~Pressure~~ Can't faze

HOMESTEAD Lever-Seald VALVES

They're Stick Proof



- Instant Stick-Proof operation.
- Quarter-turn fully opens or closes.
- Positive seal without lubrication.
- Seating surfaces always protected in both open and closed positions. Corrosion practically eliminated.
- Unobstructed straight-line fluid flow.
- All operating parts protected from damaging effects of service conditions and weather.

For 16 years, they have been first choice for difficult services where extremes of temperature or pressure or corrosive line fluids cause ordinary valves to "stick" or "seize." Due to their exclusive "Lever-Seald" construction, they render instant, Stick-Proof service. They operate fast, too . . . full open or close in a quarter-turn . . . 16 to 28 times faster than screw-stem-type valves. And because all operating parts are protected from the damaging effects of line fluids, service conditions and weather, long life, low maintenance and trouble-free service are assured.

HOMESTEAD LEVER-SEALD VALVES are made in metals and alloys to meet service requirements; sizes 1½" to 12"; for pressures from vacuum to 1500 pounds.

Send for your copy of Reference Book No. 39-3. No obligation.

HOMESTEAD VALVE MANUFACTURING CO.

"Serving Since 1892"

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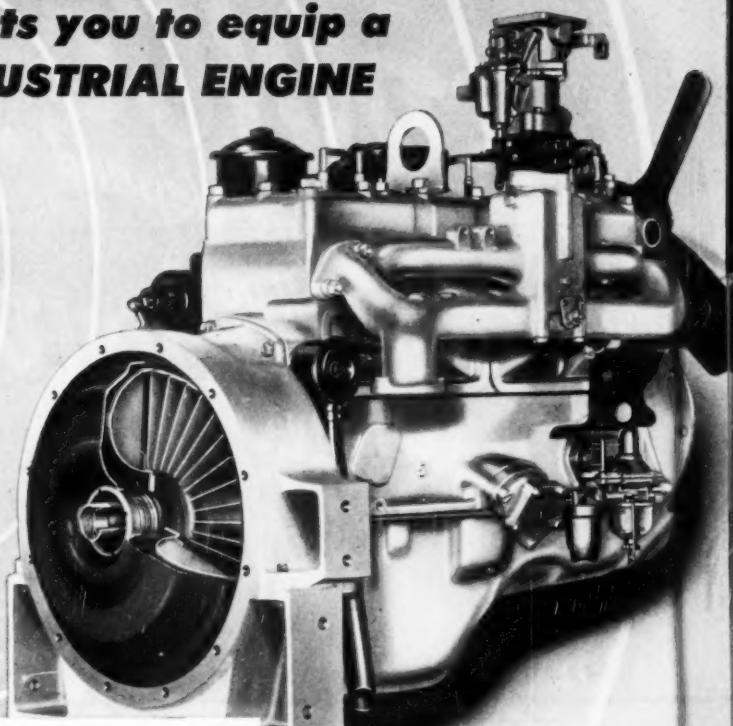
IT'S AMAZING

how little it costs you to equip a CHRYSLER INDUSTRIAL ENGINE *with . . .*

gýrol Fluid Drive!



Does operation of your equipment require frequent clutching and de-clutching?

Is your equipment subjected to damaging shock loads? Is it desirable to speed up your engine close to torque peak with the output shaft turning at a lower speed?

Do shock loads sometimes stall your engine or cause failure of drive train parts? Would gradual oil-smooth acceleration improve your operation?

If your answer is "yes" to any of these questions, better investigate Chrysler Industrial Engines now! With gýrol Fluid Coupling, Chrysler Industrial Engines bring *scores* of new advantages to the operation of power equipment.

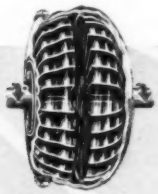
Chrysler's famous gýrol Fluid Coupling has been proved on more than a *million* Chrysler, DeSoto, and Dodge passenger cars and trucks over a period of 11 years. *Proved* on scores of industrial applications.

Its cost is amazingly low! *Actually only a few dollars more than the cost of the conventional flywheel which it replaces!* For more information, see your nearest Chrysler Industrial Engine Dealer, write us, or *mail the coupon today!*

CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE



As the driver turns inside the sealed steel drum, the confined oil produces a powerful swirling out-thrust. Instantly the Runner receives the impulsion and transmits smooth power to the load.

INDUSTRIAL ENGINE DIVISION, CHRYSLER CORPORATION
12200 E. Jefferson, Detroit 31, Michigan

Send us full information on Chrysler Industrial Engines with gýrol Fluid Coupling for use on _____ equipment.

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Quick service and complete stock SAVE YOU TIME and MONEY

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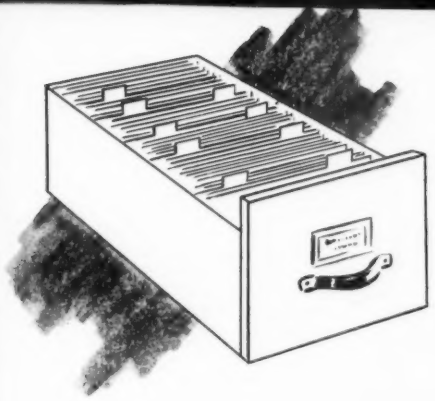
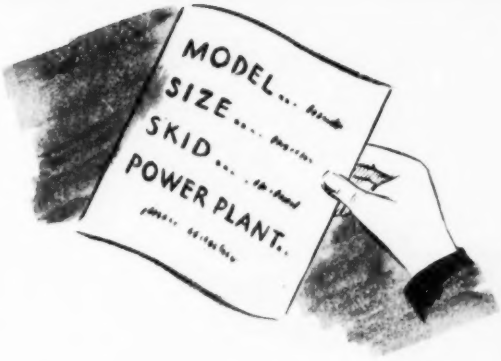
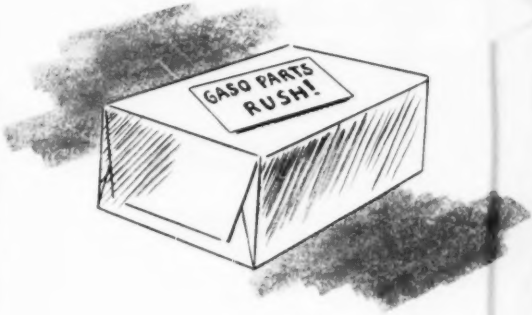


Complete detailed records

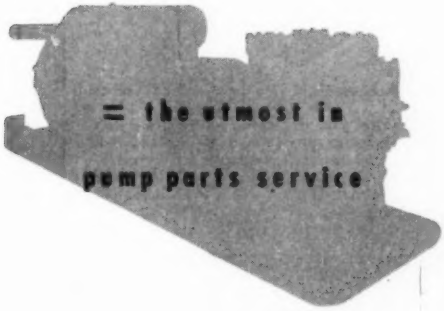


of all Gaso units

+ carefully maintained stocks of precision fitted parts



+ a policy of immediate shipment



Simple Arithmetic

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slashes

a-c motor upkeep costs

Here's how Life-Line motors can save you half the upkeep cost, and more.

A recent survey of 114 large motor users—operating 131,626 a-c motors of 1 to 50 hp—shows how much motors *really* cost when you figure actual "Life Cost".

The survey shows that the yearly average cost of periodically lubricated motors was $270 for every hundred motors installed.

On lubrication cost alone, Life-Line motors saved this $270. That's because Life-Line requires no periodic lubrication—no added lubrication of any kind.

The survey also indicates that the yearly outage cost per hundred motors, for repairs and lost machine and man-hours, was $960.

The record of 500,000 Life-Line motors in service, to date, indicates a failure rate averaging less than half that of conventional motors covered by this survey. This means over 50% indicated reduction in motor outage costs—in short, a possible saving of $480 per year with Life-Line.

Add these savings—$270 for lubrication plus $480 for outages—and the result is $750 per hundred motors per year.

Can you afford to pass up savings like these? Get the facts on the savings possible in your plant. Ask your nearby Westinghouse representative for a copy of B-4321 "How to Cut Motor Costs $750". Or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-21514

Westinghouse *Life-Line* Motors

R/M Style No. 121

R/M High Pressure Packing... Rubber Back

Raybestos-Manhattan manufactures a variety of packings especially designed for air compressors, steam pumps, steam valves, expansion joints, and similar equipment.

R/M No. 121 is constructed of asbestos cloth over a resilient core of asbestos and rubber. It is commonly used on steam engines, compressors and pumps. It is also available in solid form (No. 124) without the rubber back for high temperature service.

R/M No. 122 consists of a resilient rubber core covered with bias-cut asbestos cloth lubricated and graphited. It is recommended for reciprocating steam or air rods and valve stems. For extra-heavy service, this packing can be furnished reinforced with wire inserted cloth.

For full information on all R/M packings and a free copy of the R/M Packing Catalog, consult your oil field supplier or the authorized R/M packing distributor near you.

RAYBESTOS - MANHATTAN, INC.
PACKING DIVISION, MANHEIM, PA.

FACTORIES:
Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Passaic, N.J.

RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Asbestos Textiles • Mechanical Rubber Products • Abrasive and Diamond Wheels • Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Powdered Metal Products • Bowling Balls

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Something New!

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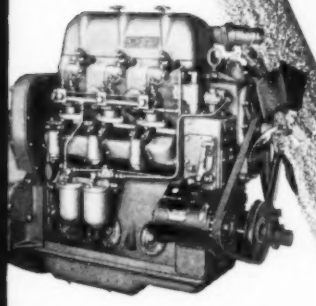
in

DIESELS

P&H DIESEL ENGINES



Model 387-C. 3 cylinder — 2 cycle.

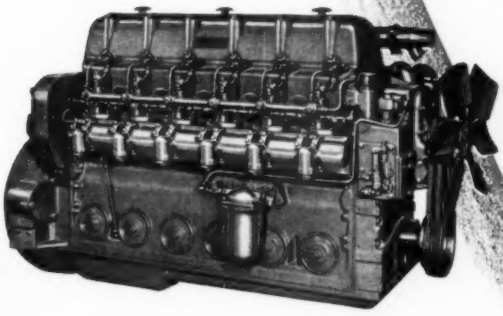
● The cylinder head and liner assemblies in P&H Diesels are independent — *removable as a unit* — interchangeable on all models.

This P&H patented feature, exclusive in the field of diesel engines, simplifies maintenance problems and reduces servicing time to a new low.

Improved Liner Construction

Longer cylinder life is provided with liners of alloy steel, *hardened* for maximum resistance to wear. Air inlet ports, machined on a compound angle, impart a strong spiral motion which promotes thorough scavenging and assures complete combustion.

Literature on request. Address Harnischfeger Corporation, Diesel Division, Port Washington, Wis.



Model 687-C. 6 cylinder — 2 cycle.

P&H DIESEL DIVISION HARNISCHFEGER CORPORATION

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How 'safety-circle' driving cuts down accidents

"Know your safety-circle!" is an important lesson taught Standard of California drivers...and perhaps it can be helpful to you.

Your safety-circle is the distance you need to meet an emergency situation—a car stopping suddenly ahead, for example. Our drivers get a special test which tells them exactly how fast they react, but in general, it takes the average person a full second to see a hazard, think what to do and act. So, driving on a clear road, at 30 miles an hour, you should stay at least 7 car lengths behind the car ahead; when you drive 45 miles an hour, stay behind 13 car lengths.

More than 5,000 Standard drivers have studied this and many other safety principles in our Driver Training Program, besides passing thorough visual examinations. Last year, they drove 41 million miles with an accident rate 60% lower than the national trucking fleet average.

STANDARD OIL COMPANY
OF CALIFORNIA
plans ahead to serve you better

Staying out of trouble isn't just being lucky . . .

here's how I sink those deep producers

"YOU'RE LUCKY, they say, when my boys bring in a deep one without the expected run of trouble.

"But, it isn't a matter of luck. It's simply that I insist on doing the whole job with NATIONAL Seamless.

"I know from experience that NATIONAL's as strong, tough and dependable as any drill pipe, casing, and tubing money can buy. But don't take just my word for it. Look at the recent results of some of the other deep drillers. For example:

"Down in Grady County, Oklahoma, Stanolind's No. 1 Brisco well was brought in flowing from 14,190 ft. with NATIONAL Seamless Casing and Tubing. And, out in Natrona County, Wyoming, Pure Oil Company's West Poison Spider Wildcat established a record as the world's deepest producer with NATIONAL Seamless Drill Pipe, Casing, and Tubing.

"Yes, out here in the oil country, we believe in being forearmed. When you're forearmed with NATIONAL, you've got the best defense you can get against deep hole trouble."

WHAT MAKES NATIONAL SEAMLESS THE MOST WIDELY SPECIFIED OF ALL OIL COUNTRY GOODS

Pierced from a solid billet of steel, NATIONAL Seamless drill pipe, casing, and tubing have no welds . . . no line of potential weakness. They are absolutely seamless from end to end.

Improved both in steel composition and physical properties, NATIONAL Seamless Oil Country Goods meet better the more exacting requirements of the deeper wells. Special upset joints and improved threading practice keep the mechanical features on a quality plane with the metallurgical properties.

For the information on NATIONAL Seamless Drill Pipe, Casing, and Tubing, write National Tube Company, Frick Building, Pittsburgh, Pa. Ask for Bulletin No. 15.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

UNITED STATES STEEL EXPORT COMPANY NEW YORK

WALLS WITHOUT WELDS

USS

NATIONAL SEAMLESS

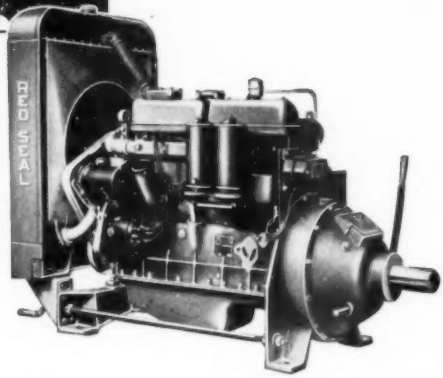
drill pipe . . . casing . . . tubing

UNITED STATES STEEL

RED SEAL ENGINES

CONTINENTAL MOTORS · Powers Half the Nation · AMERICA'S STANDARD

BUILT FOR THE JOB!



FIRST CHOICE for ECONOMY, DEPENDABILITY and SERVICE

The Red Seal line of specialized oil field engines is winning a great reputation. Available in a broad horsepower range and in models designed for any of the standard fuels, these Red Seal engines are built to handle the toughest jobs in the field. And behind every Red Seal engine is a complete parts and service network, at your beck and call when and where you need it. Write for oil field engine bulletin, indicating the horsepower range in which you are interested.

Continental Motors Corporation

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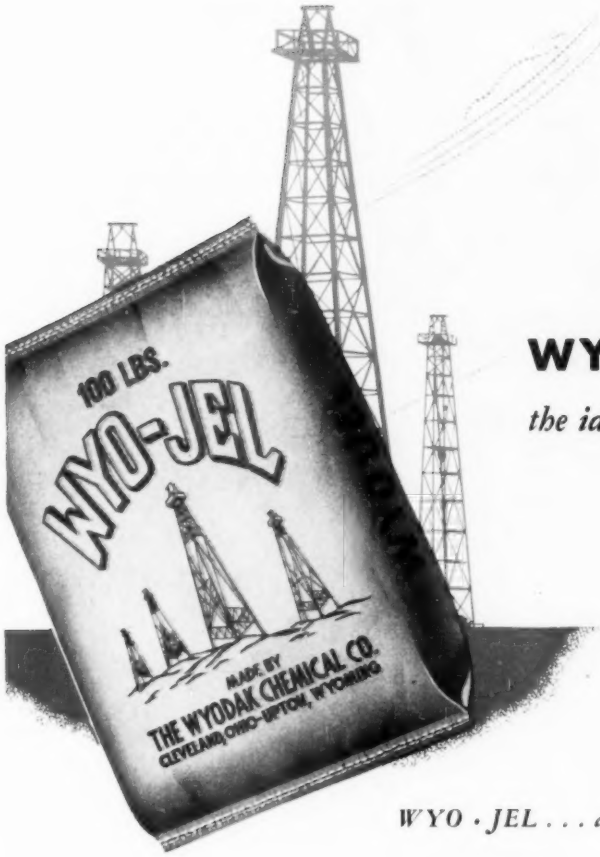
Power-full R-600

Here's the heavy duty power unit that's proving its stamina on a constantly increasing variety of installations. It is available for operation on any of the standard fuels and delivers 110 h.p. on natural gas. Many special Red Seal features adapt this engine perfectly to oil field operating conditions. Individual porting makes it smoother running — full length water jackets and a Red Seal perfected cooling system maintain correct engine temperatures in any climate. Write for the R600 oil field engine bulletin with complete specification and performance data.



WYO·JEL

the ideal drilling mud material

WYO · JEL . . . a pure Wyoming Bentonite

- Fine Particle Size
- Reduces Drilling Costs
- Lengthens Life of Mud
- Excellent Suspending Agent
- Easy to mix
- Universally Used for Many Years

JUST OFF THE PRESS!

New folder describes properties of Wyo-Jel. Includes rotary mud tests and other essential data. A copy will be mailed promptly upon request.

DISTRIBUTORSHIPS AVAILABLE

If you are interested in handling Wyo-Jel as a distributor or dealer, please write us.

WYO-JEL is easy to mix and absorbs tremendous quantities of water. Cone-and-jet mixers, or any type mud mixer, are satisfactory for mixing Wyo-Jel. World-wide use and acceptance is your guarantee you can't go wrong with Wyo-Jel.

The Wyodak Chemical Company, 4600 East 71st St., Cleveland 5, Ohio

WYO-JEL

You know it's a tight seal — it's a Nordstrom

When you operate a Nordstrom valve you don't have to battle with it. Simple slideable rotary action replaces wedging, jamming and forcing. You can open or close a Nordstrom in a matter of seconds. You don't have to guess whether or not the valve is seated—it's always seated. The effective life of Nordstrom valves is so extended that they cost less in point of service rendered—a fact proved by any comparison. *Use only genuine Nordcoseal lubricants.*

KEEP
UPKEEP
DOWN

Nordstrom

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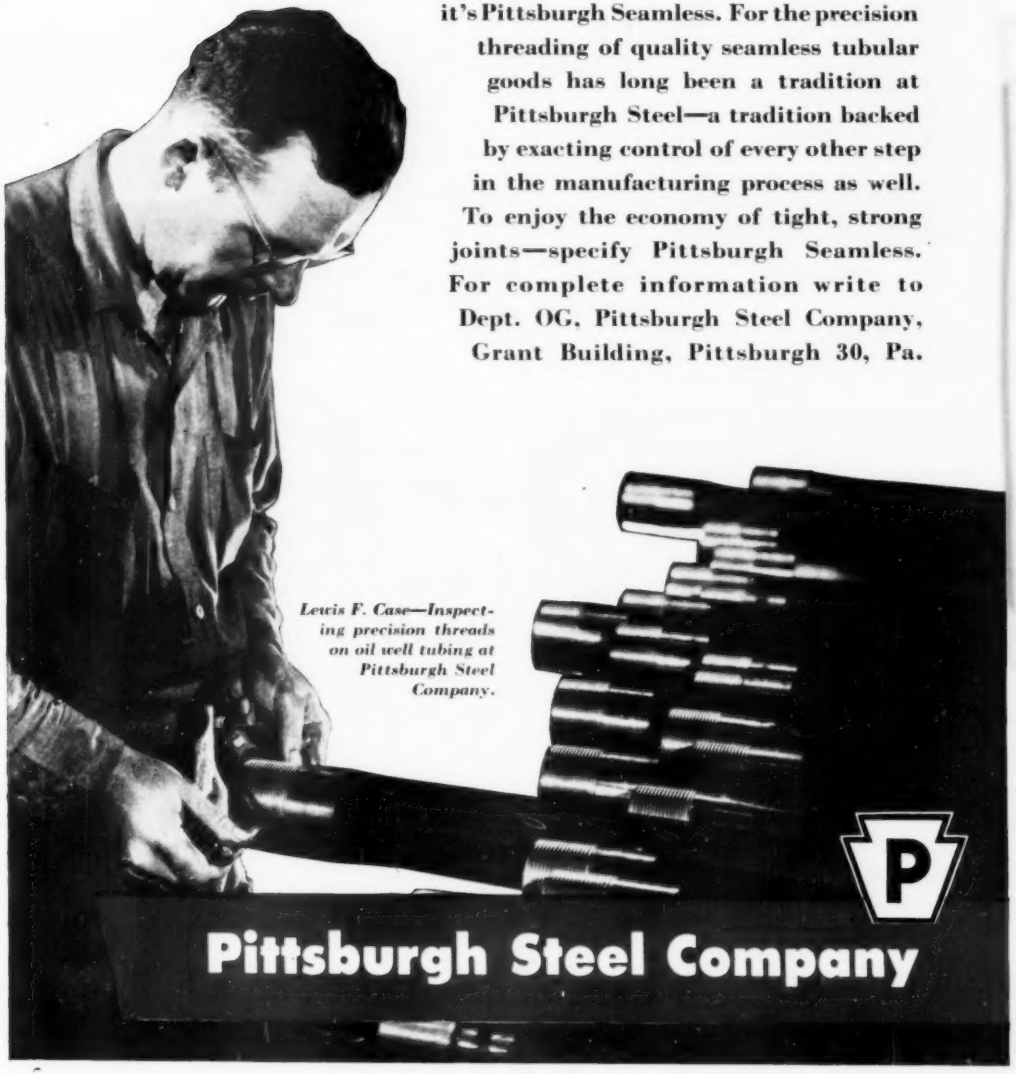
NORDSTROM VALVE DIVISION — Rockwell Manufacturing Company — Pittsburgh 8, Pennsylvania

Precision is Tradition at
Pittsburgh Steel

Your oil country tubing and casing will tong up tight with a minimum of leakers if it's Pittsburgh Seamless. For the precision threading of quality seamless tubular goods has long been a tradition at Pittsburgh Steel—a tradition backed by exacting control of every other step in the manufacturing process as well. To enjoy the economy of tight, strong joints—specify Pittsburgh Seamless. For complete information write to Dept. OG, Pittsburgh Steel Company, Grant Building, Pittsburgh 30, Pa.



Lewis F. Case—Inspecting precision threads on oil well tubing at Pittsburgh Steel Company.

Pittsburgh Steel Company

The Oil Plane *that* Raced *with* Death

FIVE-YEAR-OLD Rusty Parks rushed into the house frantically making signs to his mother that something was stuck in his throat. His face was livid.

His mother raced with him to a Ponca City doctor. Unable to reach the object, the doctor saw the boy's face purpling, and quickly cut a hole in his throat to insert a breathing tube.

"We've got to get him to a specialist in Oklahoma City—*fast*," said the doctor. "Can you get a plane?"

Mrs. Parks remembered that the Continental Oil Company had a plane. She 'phoned the plant. Could they . . . *would* they . . . help her?

You BET they would! Minutes later, the stricken lad was being flown to Oklahoma City. A waiting ambulance met the Continental plane at the airport, whipped Rusty off to the hospital. Surgery was ready.

When the doctor at last came out of the operating room, he had the cap of a lipstick case in his hand. "He'll do," the doctor nodded reassuringly. "But it was mighty close."

Rusty slept peacefully.

Yes, that's part of the oil business. Continental knows that experiences like this are matched in many another great oil company's files. Because friendly help for the community it lives in and serves comes natural to an industry that's a basic element in *every* community.

Continental's reputation, its bed-rock stability that was 74 years in the building, owes a lot, we think, to honoring this industry tradition. And our plans for greater growth, too, include it as a business asset.

CONOCO **Continental Oil Company**

Motorola meets the challenge!

announces the new "RESEARCH LINE"

solves the ADJACENT CHANNEL problem

"8" ESSENTIAL INVENTIONS make ADJACENT CHANNEL OPERATIONS PRACTICABLE

- SENSICON circuit (Pat. Pending)
- ISO-Q cavities (Pat. Pending)
- STATOMIC oscillator (Pat. Pending)
- PERMAKAY filter (Pat. Pending)
- BRIDGE BALANCED CRYSTAL OVEN (Pat. Pending)
- CAPACITANCE DISCRIMINATOR (U.S. Pat. 2,404,359)
- DIFFERENTIAL SQUELCH (U.S. Pat. 2,343,115)
- I.D.C. slope filter (Pat. Pending)

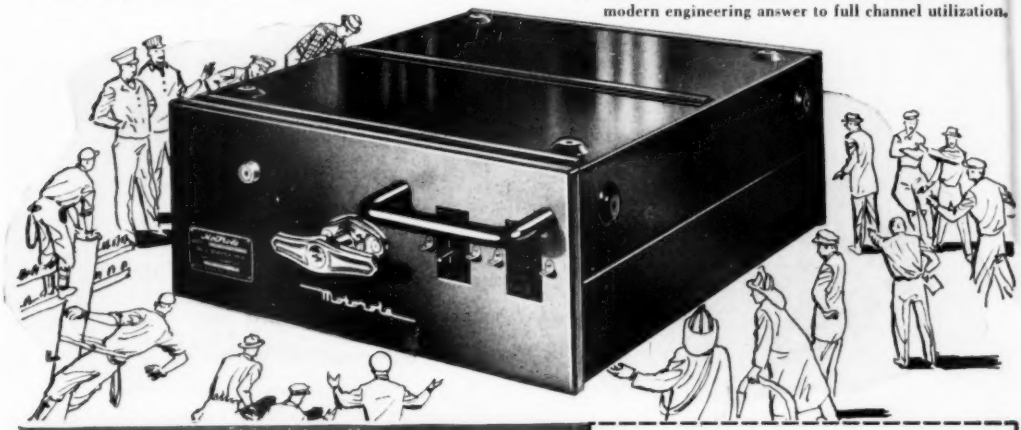
DESIGN—Today! The ideal two-way mobile radio communications equipment is here.

Research experimentation, development and field testing in systems operation produced this scientific answer to the adjacent channel operations problem.

The minor problem of super-precision selectivity was solved in six months, but two years of research and the creation of five major inventions were required to solve the major problem of intermodulation before same-area adjacent channel operation became practicable.

PERFORMANCE—Here is equipment that is new all through, with the amazing circuits which provide a new standard of performance for the industry. Here is equipment to give you the most modern communications system you can own—actually anticipating the standards of good engineering practice for the future. This startling departure from the conventional offering new simplicity of maintenance and a new standard of reliability—this engineering and scientific achievement is the new MOTOROLA.

Remember! Selectivity alone is not the answer to adjacent channel operation. The integrated systems combination of these new inventions is the modern engineering answer to full channel utilization.



the BEST is now BETTER than ever before . . .

Motorola FM 2-WAY RADIO

COMPARE feature for feature with any other equipment on the market . . . GET THE COMPLETE STORY . . . MAIL THIS COUPON TODAY . . .

MOTOROLA, INC., 4545 Augusta Blvd., Chicago, III.

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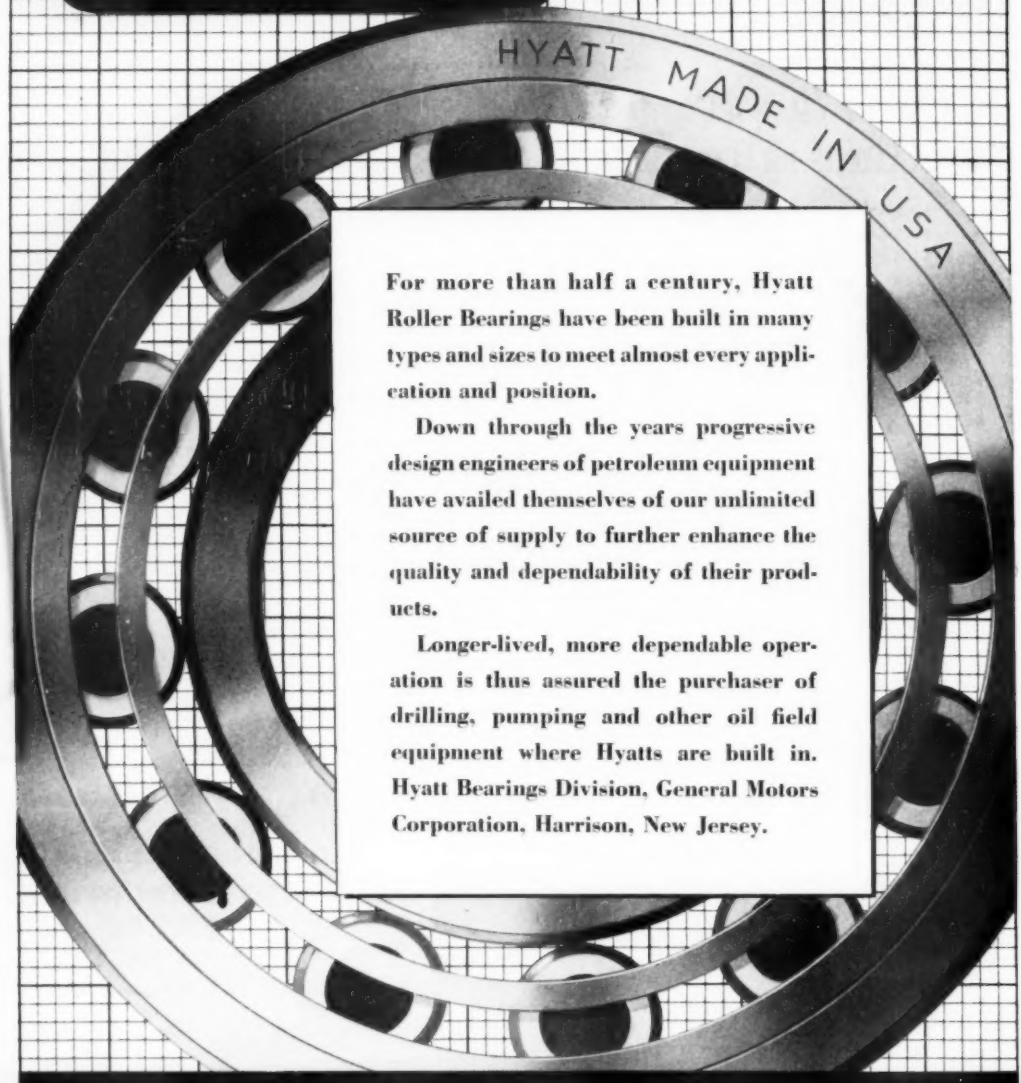
There were no
Roller Bearings
before Hyatt made them



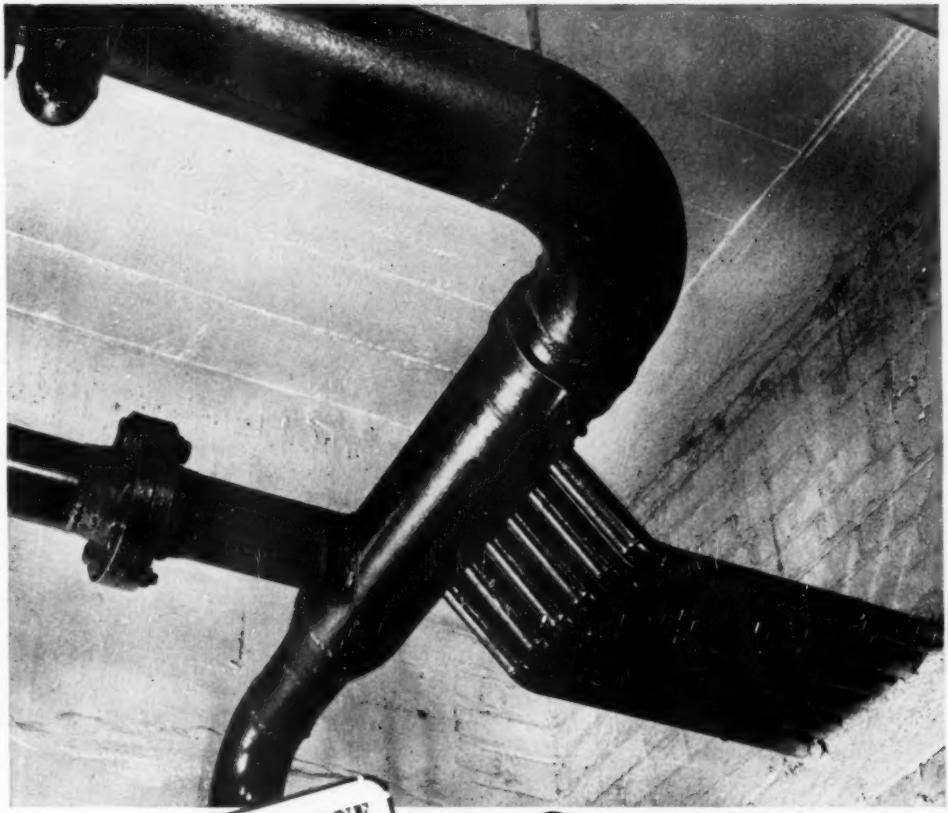
For more than half a century, Hyatt Roller Bearings have been built in many types and sizes to meet almost every application and position.

Down through the years progressive design engineers of petroleum equipment have availed themselves of our unlimited source of supply to further enhance the quality and dependability of their products.

Longer-lived, more dependable operation is thus assured the purchaser of drilling, pumping and other oil field equipment where Hyatts are built in. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

How to Tame a Tough Joint



ANOTHER JOB DONE BETTER WITH GLOBE WELDING FITTINGS

KEEP an eye on the future when you install piping — even the most innocent looking connection can become a "tough joint" through leakage — pressure-loss — the focal point for erosion and corrosion — constant maintenance time and cost.

You can tame probable "tough joints" in piping by making connections with permanently tight, leakproof Globe Welding Fittings. Strength is forged in the fittings — flow friction and pressure-loss minimized by precision formed true angles, radii, circularity—weight and space requirements reduced—exact dimensional accuracy that saves time, speeds piping assembly. To do any piping job better — use Globe Welding Fittings produced from Globe seamless steel tubes by the Globe Precision Process.

GLOBE STEEL TUBES CO., Milwaukee 4, Wis.

Producers of Globe seamless stainless steel tubes — Gloweld Welded stainless steel tubes — carbon — alloy — seamless steel tubes — Globeiron seamless high purity ingot iron tubes — Globe welding fittings.

For complete information on sizes and types send for Globe Welding Fittings Catalog.

GLOBE PRECISION PROCESS WELDING FITTINGS

Here it is—the Inside story of

PORTER *Lubricated* PLUG VALVES

A—SCREW PISTON for feeding stick lubricant.
B—LUBRICATION BARREL threaded into top of plug shank.
C—GLAND NUT
D—GLAND
E—CHECK VALVE prevents return of lubricant when renewing stick lubricant.
F—COLLAR maintained in close reading position with top face of plug by spring H under compression.
G—TOP FACE of PLUG
H—LUBE GROOVE
I—PLUG LAPPED to BODY in manufacture assures perfect leakproof fit.
J—LUBE GROOVE
K—LUBRICANT CHAMBER. Under pressure from screw piston A, lubricant creates an upward force during lubrication tending to free plug for easy turning.
For pressure-type lubrication, remove stick-lubrication barrel and replace with button-head fitting.
L—PIN prevents collar F from turning, but permits vertical movements under pressure from resilient packing N. Pin also limits plug to quarter turn and accurately positions it open or closed.
M—O-RING, under initial compression, for extra protection against leakage past shank.
N—RESILIENT PACKING compressed by gland nut between metal parts. Resilience of packing maintains tight seal between plug and body.
O—Two LUBRICANT PASSAGES from center lubricant chamber.
P—Two VERTICAL LUBE GROOVES, 180° apart. When plug is given a quarter turn, neither of these grooves passes a port.
Q—Two SHORT LUBE GROOVES leading to lubricant chamber.

SECTIONAL VIEW—PORTER LUBRICATED PLUG VALVE

Complete new catalog now available on request

PORTER "Better Built" Equipment Established 1866

H. K. PORTER COMPANY, Inc.

PITTSBURGH 22, PENNSYLVANIA

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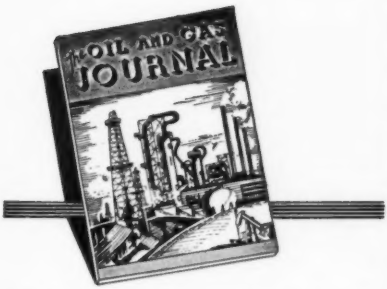

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JOURNALLY Speaking

Declaration of Independents

WHAT'S the definition of an "independent" in the oil business?

At the I.P.A.A. meeting in New Orleans recently the venerable geologist Wallace Pratt had a lot of fun with the definitions he has picked up, such as:

Any outfit never connected with the original Standard Oil Co.

Any concern not on the list of the 20 or 22 integrated companies listed as "majors" by the Department of Justice or some other government agency.

A company bigger than we are.

A producer who always believes that the posted price of crude is too low.

An operation whose management and financial source are the same.

A producer with no interest in foreign oil.

No one of these definitions seems to fit exactly. Pratt, himself, tried to frame a new one: A man sufficiently independent in actions to ignore the advice of scientists and associates and to drill for and find oil where others said there wasn't any.

The I.P.A.A. members didn't attempt to write a definition of themselves, but their statements and their resolutions made it plain that in their book an independent is one who wants the Government to keep completely out of the oil business and to refrain from financing or encouraging foreign governments which show any inclination toward developing oil under a nationalistic or a socialistic theory.

More Oil Girls

THE feminine influence in the oil business has been increasing for some time, but now it appears to be getting on an organized basis.

Not long ago this department took pleasure in reporting that the secretaries in oil-company offices in New Orleans had organized a Desk and Derrick Club to get acquainted with people who previously had just been telephone voices, to learn something about the mysterious oil terms in their bosses' dictation, and, inevitably, to have an excuse for a party now and then.

We thought that ended the matter, but apparently we underestimated the power of a woman. The gals in oil companies in Jackson, Miss., also have formed a Desk and Derrick Club, and are petitioning for affiliation as a chapter of the original group. First thing the Jackson group did was appoint a publicity chairman, which shows that the girls know their onions, as otherwise we never would have heard about the new club.

Looks like the girls have started something that has great potentialities.

Diamond to Drill

OUR editors get asked the darndest questions. Other day a wire came in asking the origin of the term "kelly" as applied to the drill stem driven by the rotary table of a drilling rig.

After consultations with the better-known historians of the Oil Capital, our engineering editor wired back (collect) that originally it was called the slide joint but there was currently a popular baseball expression "Slide, Kelly, slide," and the drillers, being baseball fans, picked it up with the inevitable result.

Now, we suppose, somebody will ask us the origin of that baseball term.

In the Pinch

THE Clothespin Manufacturers Association of America is asking the U. S. Tariff Commission to apply the "escape clause" in the reciprocal trade agreements law in order to raise the duty on imported clothespins, and if it succeeds it will set a precedent for oil producers and other industries who may be in the same pinch.

—*Henry D. Ralph*

Don't get caught with your circulation down!

JELFLAKE...the standard of the oil fields... is your best insurance against mud losses

Many experienced drilling operators find that conditioning mud with Jelflake is good insurance against mud losses. This tough, thin, fragmented plastic foil filters out on formation walls—seals off "thief" formations.

Jelflake is first choice for preventing or regaining lost circulation in many fields. It is quickly and easily used, holds its strength, will not ferment. Jelflake's crinkled surface prevents it from balling, and its low specific gravity allows it to remain in suspension in drilling mud for an indefinite time. Jelflake pumps easily through pump valves and circulating equipment, and its properties are not adversely affected by water, oil, mud chemicals, bacterial action or high bottom hole temperatures and pressures.

Jelflake is also used to prevent loss of cement slurry during cementing operations. Ask your nearest mud distributor, supply store or Dowell station for Jelflake, packaged in strong, wet-proof 25-pound bags.

DOWELL INCORPORATED
TULSA 3, OKLAHOMA
Subsidiary of The Dow Chemical Company

Keep Jelflake Handy!

Ask your nearest Dowell Station for complete information on these Dowell services and products: Acidizing, Electric Pilot Services, Plastic Service, Chemical Scale Removal Service for heat exchange equipment, Jelflake, Paraffin Solvents and Bulk Inhibited Hydrochloric Acid.

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Look to **DOWELL**

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the OIL AND GAS JOURNAL

FOUNDED IN 1910 BY PATRICK C. BOYLE

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THE OIL AND GAS JOURNAL

Return of Salesmanship

THE executive head of a large integrated oil company realized recently that about half of his sales organization had never had any experience in what he termed "normal selling."

A check showed that nearly 50 per cent of the salesmen had joined the company starting in 1939, when product markets began to stiffen as expanding demands exceeded the readily available supplies. The result was that the salesmen became "order takers," a situation which continued until late 1948. The company is correcting this fundamental operating situation with training schools to acquaint its younger and inexperienced sales personnel with what is required to sell in a buyers' market.

Competent observers agree that never were conditions more conducive to the expansion of oil volume through sound salesmanship. Millions of people in this and other countries in the decade ending this year either became important consumers of petroleum for the first time or have discovered new uses.

Farmers, manufacturers, and transporters have found it expedient to use gasoline power in many ways in addition to the expanding consumption of the family car and the commercial vehicle. Diesel power is constantly finding new applications. Millions of additional home owners and others have found it both economical and convenient to burn oil as fuel. There are literally hundreds of new uses for petroleum.

Mostly this was accomplished in recent years by the consumer selling himself, the supplier's only concern being to keep up with and service these new demands.

Times have changed and the need for the best in salesmanship has returned. The neighbor of the farmer who heats his home with furnace oil, cooks with liquefied gas, and who has several applications of petroleum power in his farm operation, can be sold. So can the plant adjoining that of the manufacturer who has modernized his operation with oil and natural gas. There is a filling-in job to be done by salesmanship—greater in its potentialities than what has been done up to now.

What applies to petroleum sales is also applicable to those who sell to the oil industry. Few if any operators have taken full advantage of the economies possible through the utilization of new equipment, materials, and services now available from manufacturers and suppliers.

"The salesman," said W. Alton Jones to employes of the Cities Service organization last week, "does not recognize overproduction; he tackles underconsumption. He is no friend of obsolescence and frozen assets; he fights for more rapid turnover. Upon salesmanship depends an expanding economy. It, alone, exerts pressure upon progress."

Texas Congressmen Organize to Seek Reduction in Imports of Petroleum

by Bertram F. Linz

WASHINGTON. — Independent oil producers last week laid the import situation before members of Congress with an appeal for quick relief from conditions which they said were leading to the extensive folding of drilling rigs, making banks shy of oil loans, and already were developing a sharp cutback in employment.

Headed by Fred W. Shield, president of the Independent Petroleum Association of America, a group of independent representatives conferred July 8 with members of the Texas congressional delegation. Result of the conference was the appointment of an informal committee headed by Ed Gossett and including Lindley Beckworth, Ken Regan, John E. Lyle, Jr., J. M. Cobbs and George H. Mahon to study the situation and come up, if possible, with suggestions for its correction.

Drilling Slowed Down

The operators told the congressional group that the continued heavy imports of oil have slowed down drilling, rigs down now being more than 16 per cent below last year. Discoveries are continuing at a good rate, they said, but only because drilling is now more selective and largely limited to the most likely prospects.

Because Texas is on a 17-day month, with 14 days shut in, Shield said, cost of production is up 40 per cent, and banks are reluctant to make loans on wells that may take years to pay out. A further cut in allowables, he said, may result in increased unemployment, which already has reached 15 per cent.

Primarily, Shield said, the domestic producers want Congress to adopt the Thomas amendment to the Reciprocal Trade Act, setting up a 5 per cent quota for oil imports, which would bring them down to around 300,000 bbl. daily from the present 600,000-bbl. level, or the Millikin amendment providing for retention of the peril-point provision inserted in the law by the Eightieth Congress.

But, he said, there were intermediate steps that could be taken, such as action by the State Department under the escape clause of the reciprocal trade agreements, or implementation of the National Petroleum Council policy on imports by concerted action of the importing companies. However, it was admitted, the question of whether there is a legal basis for the latter action has to be studied carefully.

It was admitted that the importing companies may themselves be in a bad spot, where they must either produce or pay increased royalties, and may be acting to protect their concessions against cancellation.

Shield admitted that the producers are fearful of reductions in crude prices, some 30 of which have already been made this year in low-gravity and Pennsylvania Grade crudes. Independent refiners are expected to take the lead in any price cutting, but it was admitted the majors probably would follow promptly.

Shield pointed out, however, that while continuation of the present level of imports will inevitably bring about a reduction in crude prices, such a reduction would lead to unemployment, abandonment of secondary recovery efforts, and a diminution of development which might have serious long-run consequences.

Industry Deteriorating

"Steadily, month by month, we have had to stand helplessly and watch the deterioration of the domestic producing industry," Shield said. "Under the conservation laws and regulations of several principal producing states, the allowable production has been reduced to prevent the waste that comes from above-ground storage of unneeded oil.

"Some in the administration here in Washington seem to have been impressed with the thought that im-

(Continued on page 154)

Investigation of Oil Imports Is Resumed

WASHINGTON.—The House small business committee will resume its investigation of oil imports July 14.

The committee will move to New York for hearings, with Eugene Holman, president of Standard Oil Co. (N.J.), recalled for further questioning.

Other witnesses also are expected to be heard, probably independent distributors among them, but the committee has not yet revealed its future program.

A lengthy questionnaire sent out to a number of companies to secure information regarding their imports, domestic operations, and other activities, is now under study by the committee's staff, and is expected to provide the basis for the questioning of representatives of other importing companies who will be asked to testify at future hearings.

Crude Imports Increased in May but Products Dropped; Total Below April

IMPORTS of crude oil increased during May but imports of petroleum products decreased so that the total was lower than for April, according to the most recent figures compiled from customs reports.

Imports of both crude and products averaged 579,369 bbl. per day in May compared with 602,667 bbl. per day in April. Imports of crude were 415,959 bbl. per day in May and 408,267 bbl. per day in April. Imports of petroleum products, including withdrawals from bond for supplies of vessels but excluding receipts of noncontiguous territories, were 163,410 bbl. per day in May compared with 194,400 bbl. per day in April.

Of the May crude imports, 341,917 bbl. per day came into East Coast ports, 62,448 bbl. per day into Gulf Coast ports, 11,589 bbl. per day into West Coast ports, and 5 bbl. per day into North Central customs districts.

The following table shows imports of crude oil by country of origin, in barrels per day.

	May	April
Venezuela	268,112	269,840
Colombia	22,938	31,161
Mexico	23,839	22,020
Kuwait	66,406	50,857
Saudi Arabia	34,659	34,389
Other	5	
Total crude	415,959	408,267

Texas Legislature May Return To Tax Oil and Gas Industry

by Leigh S. McCaslin, Jr.

HOUSTON.—The oil and gas industry, which already provides more than half of the state's income, was not further taxed during the fifty-first Texas Legislature which adjourned last week, but the possibility exists for increased industry taxes when the legislators return in 6 months.

Another session between November 8 and January 31 appears to be a certainty because no provisions were made during the current session for the 1950-51 budget of eleemosynary institutions. In the last-minute step to keep the state from violating the constitutional rule against going in debt, Gov. Beauford H. Jester vetoed $17,500,000 which the legislature had voted for this purpose. Thus another session will be necessary to provide for these state institutions.

The date of the next meeting of the state's governing body will depend upon the special election to be held November 8. In this election the people will vote upon a constitutional amendment providing for regular sessions of the body every January. If this amendment is voted down, the governor is expected to order a special session by January.

Following the old adage of "voting for all appropriations and against all taxes," the fifty-first legislature appropriated enough money to push the state's expenditures for the next 2 years over the billion dollar mark. The freest-spending legislature in the state's history, it spent an accumulated surplus of $100,000,000 and all the anticipated revenue for the next 2 years, with the exception of $110,000.

Many Oil Bills Passed

Twenty bills of direct interest to the oil and gas industry were enacted (see accompanying table). The most significant of these were Senate Bill 24, the unitization law, and House Bill 159, the standard gas-measurement law.

The unitization law provides that persons owning or controlling production, leases, royalties, or other interests in the same oil or gas field may enter into voluntary agreements for two purposes: (1) To establish pooled units and operate cooperative facilities for secondary-recovery operations, and (2) to establish pooled units and cooperative facilities necessary for the conservation and utilization of gas, including those for extracting and separating the hydrocarbons from the natural gas or casing-head gas and returning the dry gas to a formation underlying any leases committed to the agreement.

Considerable authority is granted the Railroad Commission under the act. No unitization agreement may become effective until the commission finds, after application, notice, and hearing, the following:

1. That such agreement is necessary to accomplish one or both of the purposes specified in the paragraph above; that it is in the interest of the public welfare as being reasonably necessary to prevent waste and to promote the conservation of oil or gas or both; and that the rights of the owners of all the interests in the field, whether signers of the unit agreement or not, would be protected under its operation.

2. That the estimated additional cost, if any, of conducting such operation will not exceed the value of additional oil and gas so recovered, by or on behalf of the several persons affected, including royalty owners, owners of overriding royalties, oil and gas payments, carried interests, lien claimants, and others as well as the lessees.

3. That other available or existing methods or facilities for secondary-recovery operations or for the conservation and utilization of gas in the particular area or field concerned are inadequate for such purposes.

4. That the area covered by the unit agreement contains only such part of the field as has reasonably been defined by development, and that the owners of interests in the oil and gas under each tract of land within the area reasonably defined by development are given an opportunity to enter into such unit upon the same yardstick basis as the owners of interests in the oil and gas under the other tracts in the unit.

In signing the standard gas-meas-

Oil and Gas Bills Passed by Texas Legislature

(Note: All bills have not been signed by the governor.)

Senate Bill 24.—Unitization law (see accompanying story).

Senate Bill 256.—Butane gas regulations. Permits the installation and connection of butane-gas appliances without a license from the Railroad Commission and amends certain regulations applying to the L.P.G. industry.

Senate Bill 314.—University lands. Authorizes the Board of Regents of the University of Texas to fix the term of all surface leases on university lands, except right-of-way easements and grazing leases; validating prior leases; and declaring an emergency.

Senate Bill 315.—Control of university minerals. Gives University of Texas regents control of all minerals, other than oil and natural gas, in university lands.

Senate Bill 338.—Leasing. Permits the leasing of lands subject to any contingent future interest for the development of oil, gas, and other minerals and provides for the appointment of a receiver to lease such lands at public or private sale and receive the proceeds thereof and reinvest such proceeds and distribute income and principal to the proper owners under order of the court.

Senate Bill 391.—Land protection. Requires oil and gas lessees to adequately protect lease premises against drainage from lands not included.

Senate Bill 397.—Oil-well service companies. Authorizes the formation of corporations to engage in the various oil-field-service company operations.

Senate Bill 481.—L.P.G. business. Fixes the amounts of liability insurance to be carried by L.P.G. dealers to cover property damage during installation of equipment.

Senate Bill 498.—Lease drainage. Requires lessees to drill or forfeit leases when oil or gas is discovered in commercial quantities within 1,000 ft. of a state lease.

House Bill 20.—Tidelands fight. Appropriates $100,000 to be used by the attorney general in prosecuting the state-federal fight over the tidelands.

House Bill 159.—Standard gas measurement (see story).

House Bill 162.—Underground waters. Provides for the conservation and use of underground waters. Applies to oil-well drilling operations where water-supply wells provide more than 100,000 gal. daily.

House Bill 417.—Unemployment compensation. Increases benefits for workers and reduces the tax paid by employers.

House Bill 599.—County-owned real estate. Provides for the sale or lease of real estate owned by certain counties in the state.

House Bill 665.—Exploration in the tidelands. Empowers the land commissioner to issue permits for exploration work in unleased tidewater areas.

House Bill 737.—Carbon-black manufacture from sweet gas. Permits the manufacture of carbon black from sweet gas under certain rules and regulations.

House Bill 768.—Leasing of state parks. Prohibits leasing of San Jacinto Battlefield and Washington Park on the Brazos, but authorizing leasing of other state parks for the production of oil and gas.

House Bill 769.—Oil and gas leases. Authorizes commissioners' courts to acquire land and buildings for the federal Government and to lease or sell the minerals therein.

House Bill 770.—Oil and gas leases. Authorizes commissioners' courts to lease oil and gas interests in county-owned airports.

House Bill 938.—Definition of carbon black for tax purposes. Amends a previous law by defining carbon black as "all black pigment produced in whole or in part from natural gas, casing-head gas, or residue gas by the impinging of a flame upon a channel disk or plate, or by any other method, and the tax herein imposed shall reach all products produced in such manners."

urement bill, the governor expressed the hope that "this standard may be recognized soon in other oil and gas-producing states and become the accepted standard over the nation." The new law defines a "cubic foot of gas" or "standard cubic foot of gas" as the volume of gas contained in 1 cu. ft. of space at 14.65 psia. and a temperature of 60° F. Whenever the conditions of pressure and temperature differ from this standard, conversion is to be made in accordance with the Ideal Gas Laws, corrected for deviation. The Railroad Commission is empowered to "determine the average temperature of gas, as produced in each oil and gas field in Texas, and to determine the other variable factors necessary to calculate the metered volumes in accordance with the Ideal Gas Laws and the variable factors to correct for deviation from the Ideal Gas Laws."

As regards existing contracts for the selling of gas, the new law provides as follows: "Whenever the provisions of this act operate to change the basis of measurement provided for in existing contracts, then the price of gas, including royalty gas, provided for in such contracts shall, if either the purchaser or seller so desires, be adjusted to compensate for the change in the method of measuring the volume of gas delivered thereunder. This provision is intended to protect parties to contracts now in existence so that after this act becomes effective the total amount of money paid for a volume of gas purchased, or required to be accounted for, under existing contracts shall remain unaffected by this act."

Variety of Subjects Covered

The remaining 18 bills of direct interest to the oil industry cover a variety of subjects as can be seen from the accompanying table. Of particular interest, perhaps, is the bill vesting the land commissioner with the power to issue permits for exploration work in unleased tidewater areas. House Bill 20 appropriates $100,000 to be used by the attorney general in the state's fight with the federal Government over the tidelands. Another bill permits the manufacture of carbon black from sweet gas under certain regulations and restrictions.

Speculation is rife in Texas oil circles on possible tax measures which may be introduced in the January session of the legislature. Industry spokesmen feel that oil and gas are already bearing more than a fair share of the tax burden and believe that any new taxes should not apply to the industry. They point out that Texas is one of the few states without a sales or income tax. However, if it is decided to levy new taxes on oil and gas, the most widely haz-

(Continued on page 154)

Pricing Bill Passed by House Should End Fears of Refiners

WASHINGTON.—Legislation legalizing the right of sellers to quote delivered prices or absorb freight was passed by the House of Representatives last week, but with amendments which will make it necessary to send the message to conference before its final adoption and transmission to the White House.

There were no indications, however, that any of the changes made by the House in the bill as passed by the Senate were so great as to endanger the prospects of its enactment, and although there had been reports that the President would veto the measure, House leaders assured that the bill would be signed.

The major fight against the bill was made by Rep. Wright Patman of Texas, who was roundly criticized by other members during the debate for his efforts to block it after the judiciary committee, following its hearings, had reported it favorably. After the judiciary committee had acted, Patman called a sudden investigation of basing-point pricing by his small-business committee, and he was told on the floor that his committee had no legislative function and was in no position to take action, particularly as the Federal Trade Commission, Justice Department, and high administration officials had already approved the measure.

The most important change in the bill, as passed by the House, was the inclusion of a modified version of the so-called Kefauver amendment that bars absorption of freight charges to meet a competitor's price where it might substantially lessen competition. The Kefauver amendment was eliminated by the committee, but the House refused to go all the way.

Under the Kefauver amendment, the right was denied to absorb freight to meet the equally low price of a competitor in good faith "where the effect of such absorption of freight will be to substantially lessen competition," and barring a "good faith" defense under such circumstances. As a substitute, the House provided that freight absorption should be barred where its effect upon competition would be contrary to the Robinson-Patman Act. Both the Federal Trade Commission and the Justice Department had agreed to elimination of the Kefauver amendments.

The only other changes made in the bill were to insert a provision justifying the maintenance, above or below the price of a competitor, of a differential in price which a seller customarily maintains, and to change the definition of the term "the effect may be" from "substantial and probative evidence" of the specified effect to "reasonable probability" thereof.

During the course of the debate, Rep. Compton I. White of Idaho complained of the price of gasoline in his state, despite its adjacency to oil production in Wyoming and Montana, and was told by Rep. Ed Gossett of Texas that if delivered prices were outlawed "you would get a lot worse gasoline and you would pay twice as much for it."

Oil Enters Debate

Instead of the District of Columbia getting gasoline at the same prices as Texas, Gossett said, the former would probably pay 40 cents a gallon and the latter 5 cents if the delivered-price system were outlawed, and the great oil refineries located in the areas of production would be broken up and scattered all over the country.

Passage of the bill by the House brought close to solution a problem which has been under study in Congress for more than a year following the Supreme Court decision in the Cement Institute case, which outlawed the use of basing-point prices.

Following that decision, the Federal Trade Commission indicated it would seek to prohibit the use of any form of delivered price and require the universal adoption of f.o.b.-mill pricing, bringing protests from some 50 industries that this would mean the shattering of our present industrial setup and necessitate a revolutionary relocation of industry.

In the case of the oil industry, it was brought out that refineries in the Southwest which have been able to compete over a large area west of the Mississippi through the use of the so-called Group 3 prices no longer would be able to meet the prices of refineries located closer to the large consuming centers.

Experimental Oil Mine Considered by I.O.C.C.

A proposal that the Bureau of Mines develop and operate an oil mine for the purpose of conducting research on various problems of recovering oil from the sands is being considered by the secondary-recovery committee of the Interstate Oil Compact Commission.

The idea motivating the proposal is that such research might show that oil sands could be mined and the crude petroleum be extracted at less cost than the production of synthetic liquid fuels from coal or oil shale.

this week

IMPORTS—Customs figures show oil imports averaged 579,369 bbl. per day in May. . . . Increase in crude more than offset by drop in products imports. . . . Total below April. . . . ¶Texas congressmen hear complaints of independent producers that imports threaten domestic industry. . . . Form committee to seek curb on imports. . . . ¶House committee resumes investigation of imports. . . . Calls on importing companies to reveal their plans. . . .

WASHINGTON—Tidelands compromise attempted again. . . . ¶ECA endeavoring to scale down plans for expansion of European refineries. . . . ¶Policy decision near on loans to Mexico and other countries for oil development. . . . ¶Restrictions on oil imports will feature new attempt to extend reciprocal trade law. . . . ¶Enactment near of basing-point price bill, eliminating refiners' fears they would be prohibited from absorbing freight. . . .

INTERNATIONAL—Trans-Arabian Pipe Line Co. spent 2 years developing water supplies for its Saudi Arabian operations. . . . ¶Wildcatting in Pakistan results in a good producer in stepout of Chakwal field. . . . ¶Brazil seeking Czechoslovakian equipment for proposed refineries because of dollar shortage. . . . ¶Syrian Government gets rights to have its crude refined in exchange for pipeline transit privileges. . . .

TRENDS—In the past 5 weeks, stocks of the four major products increased less than half that of the same period last year. . . . Total four-product gain was 205,000 bbl. daily compared with 432,000 bbl. daily last year. . . . Gasoline stocks were down 190,000 bbl. daily against 87,000 bbl. daily in same weeks last year. . . . Kerosine was up 76,000 bbl. daily this year compared with 100,000 bbl. daily. . . . Distillate increased 246,000 bbl. daily against 254,000 bbl. daily. . . . Residual gained only 74,000 bbl. daily compared with 165,000 bbl. daily in the 5-week period last year. . . .

MARKETS—Prices reduced 10 cents per barrel on grades of Texas crude used chiefly for lubricating oil and for fuel oil. . . . Changed market requirements cited as reason. . . . ¶Eastern distributors give summer discount on distillates, kerosine, and diesel fuel in attempt to spur lagging fillup campaign. . . . ¶One refiner estimates that heating-season demands will be 20 per cent over last winter and unless consumers fill storage now refiners will have difficulty meeting demands. . . .

PIPE LINES—Dedication ceremonies held at Cushing, Okla., for Basin and Ozark pipe line systems. . . . ¶Imperial Pipe Line Co., Ltd., laying 56 miles of crude-oil lines in Alberta. . . . ¶Pacific Gas & Electric Co. begins work on largest pipe line for natural-gas transmission. . . .

REFINING—Refinery workers at Quaker State Oil Refining Co.'s Oil City, Pa., plant granted wage increases. . . . ¶Labor difficulties close Crown Central Petroleum Co.'s Pasadena, Tex., refinery. . . . ¶Humble Oil & Refining Co. receiving bids for $1,000,000 worth of additional facilities at Baytown, Tex., refinery. . . .

Lighted for night operation, the Stano gasoline plant of Stanolind Oil & Gas Co. near Ulysses, Kans., is visible for many miles across the prairies of western Kansas. It can process 100 million cubic feet of Hugoton gas daily and produce 26,600 gal. of natural gasoline and 36,600 gal. of L.P.G. In operation since February, it was formally opened to inspection by local visitors this week

ECA Attempts to Scale Down European Refinery Expansion

WASHINGTON. — Discussions of British and Dutch plans for expansion of their production and refining facilities under the European Recovery Program opened last week in Washington between officials of those countries and the Economic Cooperation Administration.

Walter J. Levy, chief of the ECA petroleum branch, said the talks, which are expected to go on for some days, were of an "exploratory" nature, designed to assist the interested agencies of the three governments in obtaining a comprehensive picture of oil development and the resulting increase in supply under the Marshall plan.

Both Britain and the Netherlands plan extensive development of their overseas production and expansion of refining capacity at home. Their programs, together with those of other European countries which are seeking to cut the cost of their oil by importing crude, instead of refined products, and processing it themselves, have added up to an eventual output which ECA experts have held to be excessive as much as 50 per cent.

Grants Are Withheld

For the past year, the ECA has been prodding the individual governments and the Organization for European Economic Cooperation, through which their estimates must pass, for a more realistic program and has held up grants for refinery expansion, except for relatively small sums for a few projects of immediate necessity.

As submitted to ECA, the British program calls for a refinery capacity of 19,800,000 metric tons by 1953 and 23,800,000 tons by 1955, while the British and British-Dutch companies operating in overseas areas, would have a combined capacity of 70,000,000 tons by 1953. All told, in 1953, Western Europe would have an aggregate capacity of 65,662,000 tons at home and another 72,000,000 tons overseas, a total of 137,662,000 tons.

(Note: Dividing metric tons per year by the conversion factor of 50 gives an approximate figure for U. S. barrels per day.)

The capacity in Western Europe, according to ECA figuring, would exceed the estimated 1953 domestic demand of 62,400,000 tons by more than 3,000,000 tons, and it was pointed out that some of the countries expect to supply not only their total domestic needs from the output of domestic refineries but also to export products to neighboring, or even to more distant, countries, while at the same time such neighboring countries appear to be making plans to cover their own needs and frequently also to supply an exportable surplus from domestic refinery production.

Summing up the situation which might develop by 1953, the ECA finds it would not represent a well-balanced oil economy. On the basis of its present plans, Europe would have 59,600,000 tons of crude oil available, 57,500,000 from imports and 2,100,000 from domestic production. In addition, the country programs provided for gross imports of 18,600,000 tons of refined products and, at the same time, for gross exports of more than 10,000,000 tons of finished products.

Excess Capacity Feared

However, officials say, this lack of balance is not the only disturbing factor. Another highly important consideration that must enter into any evaluation of the program is the sizable volume of refined products likely to be available for Europe from refineries outside the continent. The result of expansion in and outside of Europe might be to pile up more than 41,000,000 tons of finished products which would have to find an outlet outside Europe, and the situation might be made even more complex by the additional refining capacity that will be constructed by non-European companies, particularly by American companies in this hemisphere and in the Middle and Far East, to meet their own increasing world-marketing requirements.

For the current fiscal year, the Marshall plan countries estimate they will need $592,374,000 worth of production, refinery, and other equipment, $211,576,000 of it from dollar sources. Refining alone calls for $313,256,000, of which $124,127,000 would be dollar equipment.

ECA officials believe these estimates of the need for dollar equipment are too high. Taking into consideration, also, that a substantial part of the program is expected to be financed by new dollar investments by American companies whose subsidiaries are operating in the participating countries, and eliminating the capital needs of American companies operating jointly with British companies outside the participating countries, it is estimated that the participating countries' own expenditure for the purchase of equipment from dollar areas may be something closer to $100,000,000 this year.

British representatives participating in the current discussions are Keith Stock of the Ministry of Fuel and Power, and Edward Jones, petroleum attache at the Washington Embassy. The Netherlands is represented by Evert Green of the Ministry of Economic Affairs and Max Moerel, adviser to the Washington Embassy.

Sitting in with Levy and other ECA experts are representatives of the State, Treasury, Interior, and Commerce departments, the petroleum committee of the Munitions Board, and the National Security Resources Board.

Senate Ends Premiums On Royalty Purchases

WASHINGTON.—The Senate last week voted to relieve small refiners of the premiums they now are paying for government royalty oil purchased in 1946 under the O'Mahoney Act to give a preference in the sale of the oil to independent processors who lacked other sources of adequate crude supply.

Under a bill introduced by Sen. Edwin C. Johnson of Colorado, the Interior Department would discontinue the collection of the premiums and credit premiums already paid to the accounts of the refiners.

Before its adoption, however, an amendment was written in providing that the premium shall not be canceled in the case of any contract which has been transferred, through the acquisition of stock interests or other transactions, to the ownership or control of a refinery which would have been ineligible for a preference under the 1946 law.

It was also provided that any refiner holding a contract eligible for relief may apply to the Secretary of the Interior for its termination, which may be granted by the secretary if he is satisfied with the reasons advanced by the applicant.

Big Percentage of Schools In Texas Financed by Oil

HOUSTON.—During the school year 1948-49, the Texas oil and gas industry provided 34 per cent of the total financing of the state's independent school districts, according to a survey released by the Texas Mid-Continent Oil and Gas Association.

Total money expended on the schools was $153,096,937, and of this amount $51,388,832 was tax revenue from oil and gas, the association said. Of this oil and gas tax money, $15,815,800 was obtained by local levy on producing properties, $9,162,093 by local levy on refineries and pipe lines, and $26,410,939 from state oil and gas taxes.

In 21 school districts, the industry furnished over 80 per cent of the total tax revenue used to support the schools. Ninety-one per cent of the revenue was supplied by the industry in Leverett's Chapel school district of Rusk County.

Standing atop the first tank car of chemicals to leave the McCarthy Chemical Co. plant at Winnie, Tex., 25 miles south of Beaumont, are: Glenn H. McCarthy, president, Hugh Neal, plant manager, and J. E. Bludworth, process developer and consulting engineer of Corpus Christi, Tex.

Shipment of Gas Chemicals Begun by New McCarthy Plant

HOUSTON.—First shipments of acetaldehyde and methanol from the new McCarthy Chemical Co. plant at Winnie departed last week for the Eastern Seaboard after brief ceremonies attended by Glenn McCarthy, president of the company, and J. E. Bludworth, process developer.

The plant, which was completed last October, is currently running at about half capacity, or 150,000 lb. of chemicals daily. Some operating difficulty is being experienced, as is common in the initial operating phases of such plants. Ultimate capacity of the unique plant is expected to be between 200,000 and 300,000 lb. of chemicals daily.

The new chemical plant, which is known as Winnie No. 1, is the first unit in a planned multimillion-dollar petrochemical development. It utilizes residue gas from McCarthy's 100,000-M.c.f.-per-day absorption plant, which is on adjacent acreage, as its raw material. By a direct oxidation process, portions of this dry gas are transformed to aldehydes and alcohols. Oxygen, which is required on a tonnage scale, is manufactured at the plant site from air.

Major products of the McCarthy plant are formaldehyde, acetaldehyde, and methanol. Formaldehyde is used in the production of plastics, dyes, explosives, and various chemicals, with plastics the major use. Methanol is itself used largely in the production of formaldehyde. Other uses are in the manufacture of other chemicals and as low-cost antifreeze. Acetaldehyde finds its end use in the production of protective coatings, plastics, paints, and chemical synthesis.

Tidelands Compromise Conferences Reopened

WASHINGTON.—Officials of Texas, Louisiana, and California met again this week with Speaker Sam Rayburn of Texas in a new effort to reach an agreement with the federal Government on the tidelands issue.

Rayburn sent out a call for the meeting last week through Walter Johnson, Washington representative of the National Association of Attorneys General, after new conversations with Atty. Gen. Tom C. Clark from which he emerged in apparently more optimistic frame of mind than after earlier talks in which he admitted negotiations were deadlocked.

Johnson invited the governors and attorneys general of the three states, as well as other interested officials, to attend the new meetings, and the group met for preliminary discussions early this week, later meeting with Rayburn.

Rayburn explained that he hoped the state officials could work out something with which he could go back to Clark and Interior Secretary J. A. Krug, who had turned down previous proposals, but said he would not call in the two federal officials unless it looked like it would be of some use.

Rayburn said he wanted to settle the problem, if it can be settled, in time for Congress to act on any legislation that might be developed.

Efforts to negotiate an agreement which would settle the ownership of the tidelands have been going on for some weeks, but with little indication that federal officials were willing to accept the terms laid down by the states.

Between sessions with the state officials, Rayburn held a number of talks with Clark, from the latest of which he appeared to believe there was a chance of working out a satisfactory arrangement. He would not disclose the basis for that feeling, however, nor indicate what suggestions Clark might have made for developing an agreement.

Special Texas Crudes Cut 10 Cents per Barrel

PRICES for two grades of Texas crude oil were reduced 10 cents per barrel by Humble Oil & Refining Co. effective July 8.

The lower postings apply to low-cold-test crudes, used chiefly for lubricating oils, produced in 11 fields along the Gulf Coast, and for Mirando grade crude, a low-gravity crude, produced in 15 fields. Magnolia Petroleum Co. also reduced its postings for Mirando crude effective July 11.

When most crude prices were raised by 50 cents per barrel in November 1946, Humble posted a 60-cent increase for low-cold test crudes because of the demand for lubricating oil. Under the new postings, low-cold-test Texas Gulf Coast crudes of 24° gravity and below are quoted at $2.54 per barrel. A differential of 2 cents per barrel per degree of gravity is paid, with a top price of $2.68 for 30° gravity and above. About 40,000 bbl. per day of this type of crude is produced on the Gulf Coast.

The low-gravity Mirando crudes, used chiefly for fuel oil, are produced in Webb and Zapata counties of Southwest Texas. The new posting is $2.51 per barrel for 24° gravity and below, with a differential of 2 cents per barrel per degree of gravity up to a top price of $2.63 for 29° gravity and above.

Humble said the adjustment wipes out a differential which has existed in favor of these crudes since November 1946 when, because of a special demand for these crudes, a higher price was posted than for other types of crude. The statement added "such special demand no longer exists and the lower posting is made necessary in order to bring the prices of these crudes more nearly in line with their value in relation to other crudes."

International

WORLD-WIDE OIL DEVELOPMENTS

Stepout of Chakwal Field Gives Pakistan a Promising Producer

NEW oil production was reported last week to have been found by Burmah Oil Co. (Pakistan Concessions), Ltd., in one of its Chakwal wells in northern Pakistan.

The well, apparently a stepout in Chakwal field, produced at the rate of 112 bbl. daily, according to a report from Karachi where headquarters for the company's Pakistan operations are located.

It marked the first success for Burmah Oil in its exploration program in Pakistan. The company has had two wells drilling in the area, 2 Chakwal and 3 Chakwal. The No. 2 well in April was near 6,800 ft. after drilling through water sands of high pressure.

Chakwal field consists of two divisions, Balkassar and Joya Mair, in each of which Attock Oil Co. has several wells. These have been shut in awaiting completion of a pipe-line connection with the line to the small refinery in Rawalpindi. Attock Oil is the only present producing company in Pakistan, operating the Potwar fields of Chakwal, Dhulian, and Khaur. Burmah Oil's concession is adjacent to the Attock properties.

Called Important Find

A Burmah Oil Co. official in Karachi said it appeared that the new producer in Chakwal would become an important addition to Pakistan's output which was last reported for February to be about 1,900 bbl. daily.

Burmah Oil also has been drilling the wildcat at Lakhra northeast of Karachi in Sind Province. It was reported last week that a second show of gas had been found at 8,250 ft. Minor gas shows were found earlier in this well around 6,350 ft.

The Potwar area with its three relatively small fields was the only oil production included in the territory which became Pakistan in the partition of the Indian subcontinent in August 1947. Realizing that an adequate supply of fuel is essential to its industrialization program, the Pakistan Government has been attempting to encourage continued exploration for oil in the country.

Regulations for the issuing of concessions were recently revised making this a function of the dominion government and leaving the percentage of capital to be offered to Pakistan at 30 per cent, according to reports. In a talk at a Pakistan Scientific Conference at Lahore recently, S. M. Ahmed, industrial adviser to the Government of East Bengal, stressed the fuel problem of the country and said that both eastern and western parts of the country appear to contain oil and that the national interest demands intensive exploration.

Bank Experts to Study Economy of Colombia

WASHINGTON.—A nine-man team of experts left for Colombia on July 10 for a 3-month survey of that country's over-all economy with a view to recommending steps for the development of its agriculture, industry, electric power, transportation, and public health.

The mission is being sent by the International Bank for Reconstruction and Development, which emphasized its importance by pointing out that Robert L. Garner, vice president of the bank will accompany it during the first week of its study. Also, bank officials said, it is the first mission to be headed by a consultant—Dr. Lauchlin Currie, formerly administrative assistant to Presidents Roosevelt and Truman—and the first to employ a considerable number of nonstaff members as consultants.

"The mission will attempt to assess the economic potentialities of Colombia, appraise the feasibility of various projects which may be recommended to improve the country's economy, and indicate the respective roles that foreign and domestic capital should play in carrying out the program," the bank announced.

The mission does not include any oil men, but a spokesman for the bank pointed out that petroleum is an important factor in Colombia's economy and it is unlikely that any comprehensive study of the country could ignore the possibilities for oil development.

Czech Equipment Sought For Brazilian Refinery

CONTRACTS with a Czechoslovakian company for equipment and with Panamerican Hydrocarbon Research, Inc., for engineering and construction supervision are reported to have been signed by the Brazilian company, Refinaria e Exploracao de Petroleo Uniao, S.A., which holds a government concession to erect a new refinery at Sao Paulo.

Actual construction of the plant, however, is contingent on the release of funds in the United States for the engineering and design and on the approval for the export of equipment from Communist-controlled Czechoslovakia.

The Brazilian company is one of two holding refinery concessions. The second is Refinaria de Petroleos do Distrito Federal, S. A., which has contracted with Foster Wheeler Corp. to build a plant in Rio de Janeiro. In addition, the government has plans for a 40,000-45,000-bbl. refinery at Belem or Rio de Janeiro for which Panamerican Hydrocarbon Research has the design and engineering contract.

These other projects also have been held up by the lack of dollar funds in Brazil. Brazil is reported planning to use its French franc credits to buy as much equipment as possible for the government refinery.

Proposals for the Sao Paulo plant call for a 20,000-bbl. daily refinery with thermal cracking and catalytic polymerization. The plant's facilities will be sufficiently versatile to handle a variety of charging stocks, Middle East or Venezuelan, since crude purchases probably would be made on the open international market.

Syria Gets Right to Refine Oil Under Pipe-Line Agreement

REFINERY processing capacity as well as a supply of crude oil to meet national requirements for products apparently have been obtained by the Syrian Government as part of its price for allowing two large-diameter Persian Gulf pipe lines to cross the country.

Trans-Arabian Pipe Line Co. reached a transit agreement with Syria in May. In addition to transit fees and payments for policing the line, Syria received the right to buy up to 200,000 tons a year (about 4,000 bbl. daily) of crude for use within the country.

Syria late last month signed a right-of-way agreement with Middle East Pipe Lines, Ltd. As a part of this, Anglo-Iranian Oil Co., Ltd., majority stockholder in M.E.P.L., obtained a refinery concession.

Terms of this refinery agreement as reported last week from Damascus provide that the company will on request process crude for the government. The crude will be of average Middle East quality in amount not exceeding that required to meet product needs for consumption within Syria. The government agreed not to permit export of any products resulting from refining of the government oil.

Refining Charge Set

The agreement also specifies that the charge made to the government for the refining will be the difference between the open market value of the products and that of the crude itself, based on Gulf Coast postings. If, during the 70-year period of the convention the Eastern Mediterranean becomes representative of world export parity in open-market petroleum prices, then this basis will be used to determine the refining charge.

The operating company for the construction of an Eastern Mediterranean refinery by A.I.O.C. is Maritime Refineries, Ltd. Although the Middle East Pipe Line project from Iran is not expected to get under way before next year and the projected refinery is in an even more preliminary stage, Anglo-Iranian is understood to be considering a substantial plant at the pipe-line terminal which would supply products throughout much of the Eastern Mediterranean area.

Processing of oil for the government to meet Syria's domestic needs would be only a small part of the operations of a major refinery. M.E.-P.L. will pay Syria certain sums based partly on pipe-line throughput, but reports of this agreement did not indicate if this company also has agreed to sell crude to the government.

The M.E.P.L.-Syria agreement also is reported to call for the payment of £50,000 (about $200,000) a year in fixed royalty and 30 shillings (about $6) per 1,000 tons throughput with a £20,000 minimum.

It also was reported the company had accepted a proposal to advance the Syrian Government £1,000,000 which will be deducted from the company's dues within 10 years. All materials imported for the pipe line are to be free of duty.

The Middle East line from Iran will be 34 and 36-in. with a capacity of 535,000 bbl. daily *(The Oil and Gas Journal, June 30, page 49)*.

Burmah Oil Co. Ready to Wildcat in Indian Jungle

Burmah Oil Co., Ltd., was reported preparing early in July to commence drilling at a new wildcat location in the Tirn Hills area in the Sibsagar district of Assam in northeast India.

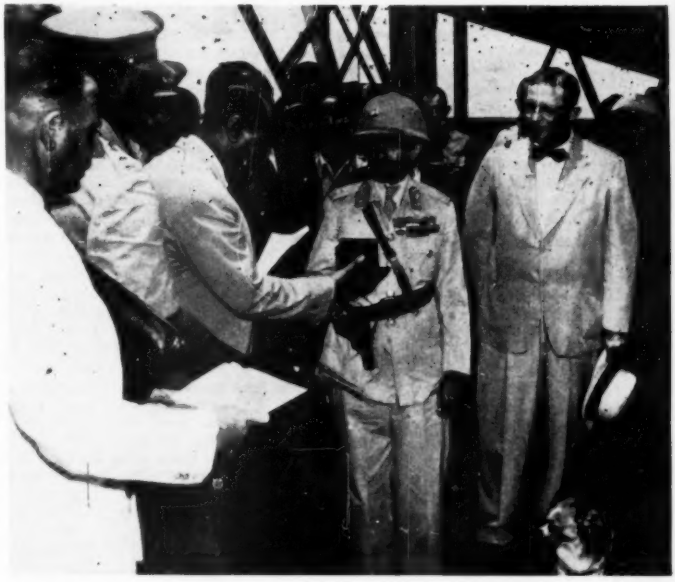
The company has been engaged for some time in preparing the site, and building access roads to carry the heavy equipment. The location is in a thickly forested jungle area near Jorhat which is located about 125 air miles southwest of Sadiya near which the company's present producing fields in India are located.

New Swedish Refinery to Go Into Operation Soon

A new refinery built by Swedish interests at Goteborg, Sweden, is scheduled to go in operation in the near future. Production capacity of the plant is reported to be 2,000,000 liters (about 12,500 bbl.) daily.

The refinery was built by Koppartrans, a company formed by two Swedish concerns, Stora Kopparberg Co. and Transatlantic Shipping Co. Facilities include tankage for the storage of about 125,000 bbl. of crude oil and about 440,000 bbl. of refined products.

CEREMONIES START ETHIOPIAN WILDCATTING



The recent commencement of operations on the first oil well ever drilled in Ethiopia was marked by ceremonies attended by Emperor Haile Selassie. Sinclair Petroleum Co., which obtained a concession over the entire country in 1945, presented the king with a gold medallion commemorating the occasion. Accompanying the emperor is Walter J. Wells (in black bow tie), Sinclair's field superintendent

Water for the Trans-Arabian Project

Two-Year Search Needed to Provide Sufficient Potable Water Along 1,067-Mile Desert Route

by Max Steineke* and Don L. Roberts†

CONSTRUCTION and operation of the trans-Arabian pipe line ("Tapline") would not be possible had it not been for 2 years spent in an intensive search for water along the proposed route.

For most of its 1,067 miles between the Persian Gulf and the Mediterranean terminus in Lebanon the line will traverse arid deserts where summer temperatures sometimes reach 130° and water holes are small and infrequent. Before definite plans for the line could be completed it was necessary to have assurance that ample supplies of potable water would be found where needed.

Every stage in construction and operation of the pipe line requires water, and plenty of it. There will be six pumping stations along the route, and because of their isolated locations, each will be a self-sufficient miniature city with its own water system. About every 50 miles between pumping stations a source of water will be required for the safety and convenience of inspection and maintenance crews.

Surveys of water resources along the proposed route were begun in 1945 by engineers and geologists of Trans-Arabian Pipe Line Co. and the parent Arabian American Oil Co. After a costly and vexing search it has been determined that the water problem can be solved and the new sources will be of great benefit to the natives of the region. The information obtained on underground water sources may also serve as a guide for similar projects in the Persian Gulf area.

No Surface Water

In all of Saudi Arabia there is not one continuously flowing river. Occasional winter rains fill the wadis, or water courses, but this water is soon lost in the desert sands. The old pilgrim routes and camel trails are spotted with cisterns, known as birkas, at intervals of 15 or 20 miles—a day's camel ride. Some of these limestone catchments were built as long as 1,200 years ago, but the surface water they catch is insufficient for the needs of the pipe line.

Underlying the whole area west of the Tigris-Euphrates valley and the Persian Gulf are stratified rocks, consisting largely of limestone, which slope gently eastward at a rate of less than 1°. These rocks are slightly soluble, and the water which has run over and through them for geological ages has carved channels and caverns through which great volumes of water can pass. During its migration eastward through these channels the water dissolves salts out of these rocks. A better grade of water is generally found in the interior, but wherever the rock formations contain unusual amounts of readily-soluble, salt-bearing minerals, the water can be expected to be high in total salt content. This condition prevails in the large area of the coastal region between Abu Hadriya and Kuwait Bay. Unfortunately, Tapline's main port of entry, Ras el Misha'ab, falls in this region of bad water.

*Consulting geologist, Arabian American Oil Co. †Vice president, Bechtel International Corp.

Early Survey Made

During the winter of 1945 a Tapline party with an old cable-tool rig drilled seven wells along the central part of the proposed pipe-line route and discovered good water at depths varying from 247 to 1,078 ft. This demonstrated that sufficient water could be found in the needed locations, and plans were completed for developing a water supply ahead of the pipe-line construction crews.

In March 1947 active work was started on the pipe-line project itself. It was decided that water wells should be drilled at each pumping-station location, and that two intermediate wells would be drilled between pumping stations. The contractors' work was so planned that construction camps would be located at each of these wells; thus they would serve the double purpose of making water available for construction forces and later for the personnel employed in the operation of the pipe line.

Equipment, trucks, camp facilities, and provisions were ordered for two well-drilling crews. This was some of the first material to arrive in Arabia. A sequence of drilling was established that would provide wells as needed for the contractors' forces. This sequence was such that drilling could not progress uniformly from one end of the line to the other.

In contrast to the comparatively primitive type of equipment used by the original exploratory party, each crew was furnished with a rotary-type drilling rig mounted on a truck. A second truck carried repair parts and tools to service the drilling rig. Supply trucks transported food and tanks of fuel and water. Each American camp was entirely on wheels—bunkhouse, kitchen, and messhall. The Arabs of the party lived and ate in tents. Truck convoys were organized to bring fresh food, fuel, and water from the Dhahran base to the crews in the field.

Permanent Stations Built

By June 1948 nine additional successful water wells had been drilled along the course of the pipe line. They varied in depth from 290 to 805 ft. In one well the water came within 7 ft. of the ground surface and in some of the deeper wells it was as much as 400 ft. below the ground surface.

After each well was drilled it was cased with a 6 or 8-in. pipe and a pump was installed. The pumps were mounted above ground on concrete bases, and were driven by gasoline engines. Should future drilling produce wells in which the water level is more than 650 ft. below the surface, a deep-well type of pump will be installed.

The pumping stations, when completed, will have sufficient tanks at each location to store 250,000 gal. of water. Some of these tanks will be set on the ground, others will be mounted on 70-ft. steel towers to provide pressure at outlets throughout the camp. A portion of the supply will be distilled and treated particularly for human consumption and for use in certain pieces of equipment.

The installations at the intermediate wells between pumping stations consist of a 10,000-gal. tank set on a steel tower 20 ft. above the ground, a small house to cover the well pump, and an engine and tank to supply fuel for the engine. All will be enclosed by a high woven-wire fence. Just outside the fence a watering trough will furnish water for nomadic Arabs and their herds of camels and goats. A swing spout extending over the fence will allow the pipe-line maintenance men and other travelers to fill their car or truck radiators, water cans, or tanks without entering the enclosure. An automatic gage on the tank will start and stop the pump as necessary to keep the tank

Above: The birka, or cistern, at Jumaima, built 1,200 years ago. Left: Hauling water from Jauf well for Tapline's main camp at Misha'ab, 40 miles away

full of water, so no operator will be required.

Because of its location in an area of bad water, the base camp for the Tapline project at Ras el Misha'ab had its own peculiar problems of water supply, which were considerably more expensive and difficult to solve than those for the pumping stations. This camp is situated on the shore of the Persian Gulf about 150 miles north of the Arabian American Oil Co.'s developments at Abqaiq, Dhahran, and Ras Tanura. It houses all administrative personnel, the main repair shops and garage for the project, base warehouses, the pipe-jointing plant, laundry, hospital, and other centralized functions.

Since the Ras el Misha'ab camp was planned for 500 Americans and 1,200 Arabs, it was necessary that a certain and adequate water supply be found. It was estimated that each American would require 50 gal. of potable water per day. The Arabs would require only about 20 gal. per day per person, since they bathe in sea water. To minimize the total amount of potable water required, all toilets, both Arab and American, and the fire system for the camp were separately piped so that sea water could be utilized for these functions. At peak capacity it was estimated that human consumption, bathing, cooking, the laundry, the air-conditioning system, and certain pieces of equipment would require a supply of approximately 70,000 gal. of potable water per day.

The nearest existing water well was at El Jauf, 40 miles to the west, and the water from this well was barely palatable. Water was hauled from Jauf during the early days of construction, but the men and equipment used for this operation were sorely needed elsewhere, so several attempts were made to secure water in the proximity of the camp. Three wells were drilled; the first was within 3 miles of camp, and the last was 25 miles away. None of them proved successful because of the high salt and mineral content of the water.

Various means of supplying water for this camp were studied in the United States at the time the camp was being planned. A pipe line from the Jauf well was considered as one possibility. Another suggestion was that barge loads of fresh water be towed to Ras el Misha'ab from Ras Tanura or from the head of the Persian Gulf.

Inspired by Solution

This latter idea was inspired by the solution for its water problem followed by the City of Kuwait, also located in a brackish-water area on the Persian Gulf shore 100 miles above Ras el Misha'ab. For several centuries this city of more than 60,000 inhabitants depended for its water supply upon a primitive fleet of dhows that brought water in casks from the Shatt el Arab, the combined delta of the Tigris, Euphrates, and Karun rivers.

It was eventually decided that distillation equipment, such as was used on Navy vessels during the war, would provide a practicable means of furnishing water, through distillation of the raw sea water from the adjacent Persian Gulf. Several small machines of this type, each capable of producing 90 gal. of distilled water per hour, were sent to the job during the early stages of construction. Six larger machines, each capable of producing 600 gal. per hour, were purchased for the permanent installation at the camp. Preliminary experiments with one of the smaller machines indicated that the distillation of the Persian Gulf water would not be an easy matter; therefore, trained technicians were sent to Arabia to study the problem of water chemistry and devise an efficient operation for the distillation units.

Upon completion of this study, it was found necessary to treat the water as it left the Persian Gulf; to treat the water further as it passed through the distillation machines; and, finally, make a third treatment before the distilled water was allowed to circulate through the camp. The mechanical distillation of sea water, even today, is not perfect and production is only about half total camp requirements. To supplement this supply, water is still being hauled from Jauf and carried by barges from the Arabian American Oil Co.'s wells at Ras Tanura.

As a final solution of Ras el Misha'ab's water problem it is planned to lay a 6-in. water line to that camp from Tapline's Pump Station No. 2, 50 miles to the south of Ras el Misha'ab. Wells have been drilled at this station which promise a satisfactory supply of good water.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

Loan Policy Nears

WASHINGTON.—The State Department may come up within the next few days with the long-awaited answer to the question of what the administration's policy will be with respect to loans to Latin American countries for oil development.

Secretary of State Acheson admitted last week that the department had about completed its study of Mexico's application for a loan to finance its 5-year oil development program, but refused to indicate the position it would take.

A number of men prominent in the oil industry have written the department to protest any government advance to Mexico, taking the position, in general, that any loan based on that country's oil would be a poor risk and pointing out that all Mexico has to do is amend her laws so as to permit private enterprise to enter the oil field if she really desires to get quick, efficient, and maximum development.

The question of a loan to Mexico now has been knocking around Washington for some 4 months, the important problems involved being, first, whether the United States should break its rule of not making loans for exploration and development and, second, if it adhered to its traditional position whether a loan for transportation and refining facilities would be advisable.

On the latter point, Max Ball recently pointed out that Mexico would not be justified in spending large sums on facilities without more crude production and held that a loan would not be a good risk unless Mexico could show she would have the required crude output.

But while there is no great opposition, in view of Mexico's laws, to a loan for facilities, provided it is properly backed by crude potential, the main interest of domestic oil men is in the administration's position on loans for exploration and development, a decision which also is awaited with interest by other Latin American countries which also would like the United States to finance the development of their oil industries.

Olds' Hole

NOMINATION of Leland S. Olds for another term as a member of the Federal Power Commission may wind up in a Senate interstate commerce committee pigeonhole.

Although administration leaders have expressed the opinion that the session will not end until just before Labor Day, members of Congress are aiming at an earlier adjournment and are beginning to sidetrack controversial issues that would stand in the way.

There is every indication that Olds' nomination will be the subject of a bitter fight. A number of senators, Robert S. Kerr of Oklahoma prominent among them, are against Olds because of his adamant opposition to Kerr's natural-gas bill and the views he has expressed regarding the role of the FPC in the natural-gas industry.

Olds' speeches, statements, and articles for as far back as 30 years are being scanned for ammunition to be used against him. Any hearings on his nomination are sure to be long drawn out and there also would be a strong fight against confirmation on the Senate floor.

If the nomination is sidetracked, as expected, it is probable that President Truman will give Olds a recess appointment, as he did in the case of Thomas Buchanan, the last man to be appointed to the FPC.

Trade Act Trading

LEGISLATION extending the Reciprocal Trade Act is expected to be brought up in the Senate for consideration within the next week or two, and one final effort is to be made to protect American industry against the competition of unlimited imports.

Three plans for safeguarding the domestic market have been proposed and the Senate will be asked to vote on each separately.

One amendment, offered by Sen. George Malone of Nevada, would eliminate the reciprocal trade agreements entirely in favor of a "flexible" tariff arrangement under which rates of duty could be adjusted periodically to insure that the delivered cost of imports was in line and competitive with the prices of domestic producers.

A second amendment, proposed by Sen. Eugene D. Millikin of Colorado, would preserve the "peril point" provision written into the act by the last Congress, which prohibits the President from cutting import duties below a figure which the Tariff Commission reports would endanger domestic industry.

The domestic oil producers, however, are behind a third proposal, offered by Sen. Elmer Thomas of Oklahoma, which would revive the quota system originally adopted by the administration with respect to imports under the Venezuelan trade agreement in 1939. Thomas would limit total imports from all countries to 5 per cent of the domestic demand in the corresponding quarter of the year preceding that of importation. This would permit imports to rise and fall in accord with seasonal trends, and adequacy of supplies would be insured by a provision for suspension of the quota during any period when domestic production might be insufficient to meet demand.

President Truman has called for extension of the law without any strings whatever, and the administration is not expected to accept any of the amendments which have been offered.

Congress, however, is becoming increasingly sensitive to the change now occurring in the economic situation and may act to check the flow of foreign oil into the country, leaving it to the President to accept its demands or see the whole reciprocal trade program abandoned.

England's Oil Muddle

WASHINGTON officials who have been watching Britain's financial situation see several ways in which the English Government can carry out its intention of cutting back on purchases of dollar oil and other commodities to relieve the drain on its fast-dwindling dollar and gold reserves.

They generally believe, however, that England will attempt to adopt a method which will not give any basis for charges she is discriminating against the United States, particularly in view of the dissatisfaction expressed here over the recent trade agreement with Argentina which may close the Argentine market to United States oil companies for several years.

It is not expected that Britain's new austerity program will develop overnight but that, rather, the curtailment of dollar imports will be brought about gradually over a period of some weeks. The Labor Government already has announced that no existing contracts will be affected.

One way in which the dollar drain can be lessened, so far as oil is concerned, would be by simply cutting down on purchases of gasoline and other refined products, either curtailing consumption in the United

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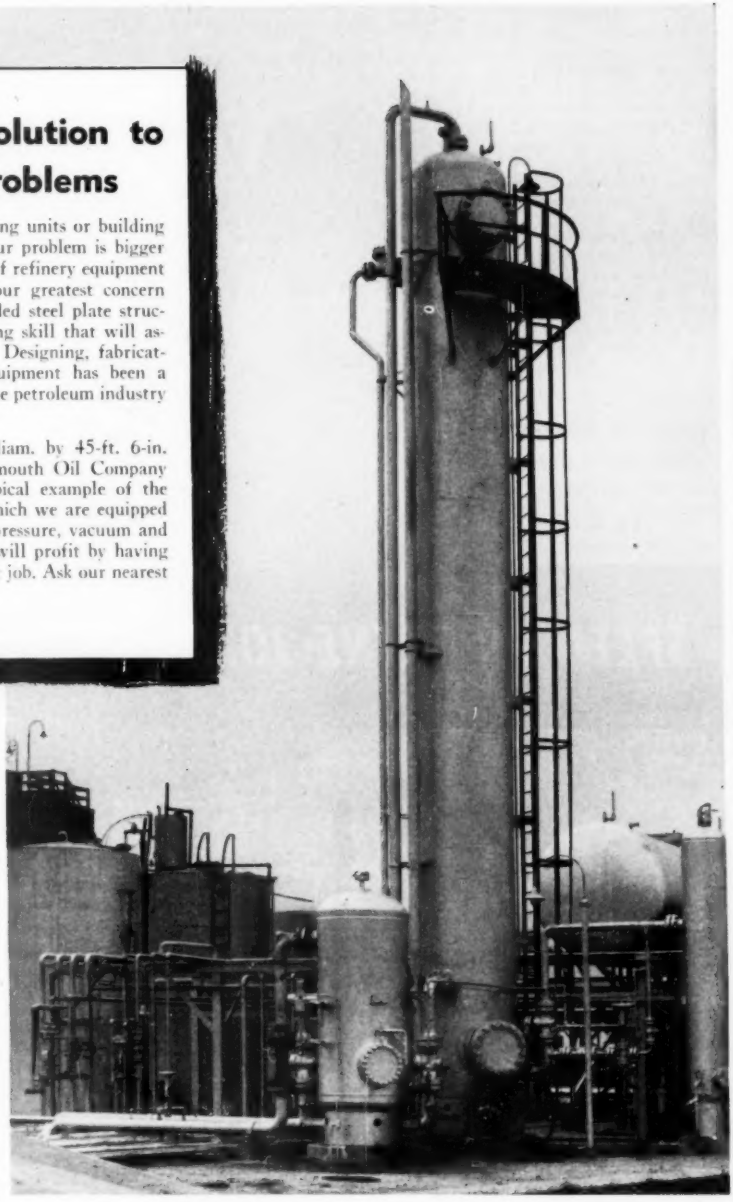
We built this 4-ft. 6-in. diam. by 45-ft. 6-in. absorber column for the Plymouth Oil Company at Sinton, Texas. It is a typical example of the many steel plate structures which we are equipped to build for a wide range of pressure, vacuum and temperature conditions. You will profit by having us work with you on your next job. Ask our nearest office for quotations.



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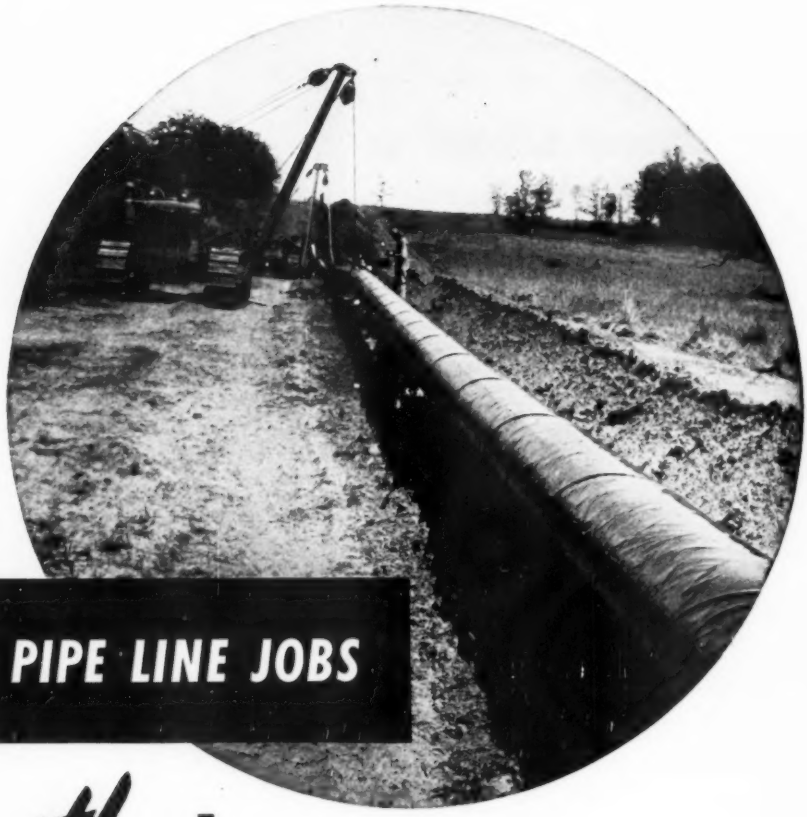
Chicago 3.....
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 14.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3.....1615—1700 Walnut Street Bldg.
Salt Lake City, 1.1525 First Security Bank Bldg.
San Francisco, 11.1254—22 Battery Street Bldg.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Compania Tecnica Industrie Petroli, S.A.I., Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
Chicago Bridge & Iron Company, Ltd., Apartado 1348, Caracas, Venezuela



SPEED PIPE LINE JOBS

with these "Extra Feet"

Workmen seem to move along faster when they install a line with ARMCO Welded Steel Pipe.

The answer is that longer lengths, up to 50 feet, mean fewer joints to assemble—fewer sections to handle and haul. Work goes faster and costs are sliced to the bone.

ARMCO Welded Steel Pipe has ample strength and ductility to assure long life in the toughest service. It is uniformly strong with a high safety factor against internal and external pressures. There are no surface defects because the patented method of manufacture permits visual inspection of both sides of the pipe wall.

Diameters of ARMCO Steel Pipe range from 6 to 36 inches with wall thicknesses from 9/64- to 1/2-inch. You can match exact job requirements—there's no excess weight or material.

These are just a few of the reasons why pipe lines go in faster, better and more economically with ARMCO Welded Steel Pipe. Write for the complete story. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1685 Curtis St., Middletown, Ohio; 501 Mayo Building, Tulsa, Oklahoma. Export: The Armco International Corporation.

ARMCO WELDED STEEL PIPE

ARMCO

Kingdom or making up the deficit by purchases from English companies in the Middle East. The latter, however, might give rise to charges of discrimination and at the same time the diversion of the oil from markets now being supplied by the English companies would leave gaps which the United States companies would fill, the results being that our companies would be little affected by England's program.

While it is all still in the realm of speculation, of course, some believe that England may cut her purchases from both United States and her own companies. Under that method there could be no feeling of discrimination and the English companies would have additional products to sell in hard-currency countries. Here the result would be that England would save some exchange on her dollar imports and gain some on the increased foreign sales.

Britain's present difficulties arise from the fact that her export trade with the United States has failed to cover her dollar imports above those provided under the European Recovery Program.

Her operations under ECA are not involved in the situation. During the first 15 months of the recovery program, England was authorized to secure some $200,000,000 worth of dollar oil and products, and the ECA already has approved bills for some $153,000,000, but this was not sufficient to meet all United Kingdom requirements.

Recession Panacea

DEVELOPMENT of antidepression legislation, for enactment next winter if industrial activity toboggans in the intervening months, is expected to be speeded up by President Truman's midyear economic report to Congress.

A rough draft of such legislation already has been written by a group of liberal senators, and copies have been circulated among business, labor, agriculture, and government leaders for their comment and suggestions.

To considerable extent—minus price and wage controls and materials allocation and plus such aids as long-term, low-interest loans for small business, development of long-term plans for public works, etc.—the proposed measure is along the lines of the ill-fated Spence bill introduced last February to curb inflation.

A major feature of the bill would be the authorization for aids to industry in certain areas where the President could declare "capacity bottlenecks" to exist, including synthetic liquid fuels.

In those areas, a number of steps could be taken to stimulate private investment, including accelerated amortization of facilities for tax purposes; technical services, research contracts, credit insurance, and loans provided by the Government, and the lease or sale of government war plants (including rehabilitation of their equipment) to satisfy capacity needs.

But where these steps prove to be inadequate for the expansion of capacity, the President could provide for the construction of needed plants or facilities by the Government for lease or sale to private enterprise in a limited number of fields, but again including synthetic fuels.

These provisions of the bill are notable for the inclusion, among the industries in which the Government could act, of projects which long have been pressed by the administration and liberal members of Congress, not only synthetic liquid fuels but such things as steel, electric power, and fertilizer.

The same idea of forcing production where industry will not act underlines another provision of the legislation calling for industrial resources development in "economically underdeveloped" or declining geographic areas of the country. Here, the Governmnt, in addition to advising and stimulating state and regional development organizations, would insure up to 90 per cent of private investment in such organizations.

ECA Ties ERP Prices To Domestic Figures

WASHINGTON.—A new regulation issued by the Economic Cooperation Administration links prices to be approved for petroleum purchases under the European Recovery Program to domestic prices, but is not expected materially to affect the industry either at home or abroad.

Briefly, the new regulation, an amendment of Regulation 1, provides that for offshore purchases, the delivered price to be eligible for ECA payment may not exceed the lower of either the United States market price plus transportation to the same destination or the market price in the country where the commodity is purchased, plus transportation to destination.

For domestic purchases, ECA will require that prices approximate, as nearly as practicable, the lowest competitive market prices and will not finance the payment of a price which exceeds the supplier's price in a comparable domestic sale, adjusted by his export differential.

Charter Granted to Newly Organized Oil Corporation

HOUSTON. — LaGrange Petroleum Corp., a new firm, has been granted a charter to drill, produce, and explore for oil in Louisiana and Mississippi.

The company recently purchased interest in several wells in LaGrange field of Adams County, Mississippi, from Big Chief Drilling Co. of Oklahoma City. President of LaGrange Petroleum is H. L. Rowley, Shreveport. Other officers are: William T. Payne, Oklahoma City, vice president; Charles F. Hayes, Shreveport, secretary-treasurer; and Rex L. Shaver, Shreveport, member of the board of directors. Offices of the new firm will be in Shreveport.

Next Week

Oil-well corrosion and economics of its control.—Robert J. Villagrana and William W. Messick, with Standard Oil Co. of California, discuss their investigation on various forms of corrosion in oil-well operations. The report outlines in detail some of the economics involved in combating typical field problems.

Rotary compressors for field booster service.—Maintenance and operating costs over a 2-year span are broken down in this article by E. O. Hinton, repair supervisor, compressor-station department, Southern Carbon Co., for installation in Louisiana.

Analysis of absorber oils.—By employing simple apparatus in conjunction with a low-temperature fractional-distillation column, author John V. Brubaker, assistant superintendent of Pure Oil Co.'s Van, Tex., plant, describes check for rapidly determining stripping and absorption efficiencies.

Reforming straightrun gasoline for octane improvement.—The economic balance between thermal reforming and the use of additives for octane improvement of straightrun gasoline is reported on by Pan American Refining Corp.'s C. E. Feuchter.

Rock shields reduce costs of pipe-line construction.—The Journal's pipe-line editor, Paul Reed, reports on a new practice in pipe-line building which eliminates the need of padding for protecting line coating, thus speeding over-all construction.

Stratton-Agua Dulce field conservation project.—How Chicago Corp. has expanded its plant facilities to keep pace with field requirements is outlined by Roy A. Schuster, superintendent, and Frank Jones, engineer of the project.

PERSONALS

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Bramstedt Well Suited To New Caltex Position

W. F. BRAMSTEDT, newly elected as executive vice president and a director of the Caltex-Bahrein group of companies, has a background of 22 years' experience in oil-industry operations, 18 of which were spent with the Standard Oil Co. of California organization.

Bramstedt formerly was a vice president of Caltex, in charge of crude-oil marketing, before becoming president of Mid-East Crude Sales Co., Ltd., in September 1948.

Born in the Philippine Islands in 1905, Bramstedt received a degree in mechanical engineering from the University of California in 1926 and joined California Standard's engineering department in San Francisco in February 1927. Much of his career with the company was in the refining branch.

From 1928 to 1930 he was assigned in the construction and maintenance of refinery equipment, and worked on the management staff of the Richmond refinery on analysis and control of operating costs, standardization of process methods, and other studies. In 1940 he went with Standard Oil of British Columbia, a California Standard subsidiary, as vice president and director in charge of refining and marine transportation.

From 1934 to 1945 Bramstedt was vice president, director, and project manager in the field for Standard Oil Co. of Alaska, a California Standard subsidiary which was contractor to the War Department on the Canol project. He returned to California in 1945 and in November 1946 served as process superintendent at the El Segundo refinery. Bramstedt then joined Arabian American Oil Co.'s sales department as technical representative on crude-oil sales, continuing in this position until March 1947 when he was elected a vice president in charge of crude sales for Caltex.

H. G. Denham has been elected president of Mid-East Crude Sales Co., Ltd., succeeding **W. F. Bramstedt** who has returned to California Texas Oil Co., Ltd., as a director and executive vice president of the Caltex-Bahrein group. Denham, whose offices are in New York, joined Standard Oil Co. of California in 1927 and has served as president of California Commercial Co. He most recently has been special assistant to the president, California Texas Oil Co., Ltd.

DeWitt Potter, member of the Panhandle division geological department, Phillips Petroleum Co., has been transferred to Calgary, Alta., Canada, from Amarillo, Tex.

J. H. Sembower has been appointed to the newly created post of assistant to the executive vice president of Shell Oil Co., Inc.

Ralph D. Chambers has been named district geologist in the Midland, Tex., area for Vincent & Welch, Inc., new petroleum-exploration firm headquartered in Lake Charles, La. Chambers recently resigned a position in the geological department of Continental Oil Co., Permian Basin district. He formerly was division geologist for Richfield Oil Corp. in Midland before joining Continental.

Robert E. Stripling, formerly chief investigator for the Un-American Activities Committee of the U. S. Congress, has moved to Midland, Tex., where he will enter the oil business as an independent operator.

Harry L. Arnold, former assistant state attorney general for the State of Illinois, has been appointed as assistant to the president of Carter Oil Co., Tulsa. He has been with Carter since 1946, headquartered in Mattoon, Ill.

Thomas V. Sheehan, assistant head engineer, light-oil design, Standard Oil Co. (Ind.), is now on loan from the company to Associated Universities, Inc., at Brookhaven National Laboratory, Upton, N. Y., as operating consultant on the new nuclear reactor and auxiliary equipment.

Thornton Anderson, geologist for Gulf Oil Corp. at Wichita, has joined the staff of Skelly Oil Co., West Texas-southeast New Mexico district, as geologist with headquarters at Midland, Tex. **Allen Ehlers** is district geologist for the area.

Lundy O. Allen, Checotah, Okla., geologist for Cities Service Oil Co., has resigned to become geologist and first vice president of Sells Petroleum, Inc., Gladewater, Tex.

Donald B. Eicher, geologist with Standard Oil Co. of Egypt, is working temporarily on a special assignment in Tulsa with the geophysical department of Carter Oil Co.

Dr. Hugh Dinsmore Miser, staff scientist of the U. S. Geological Survey, Washington, D. C., has been given the degree of Doctor of Laws by University of Arkansas. He is a native of that state.

V. W. Rogers, Midland, Tex., area exploration department, Shell Oil Co., Inc., has been named district geologist of the eastern district, replacing **G. W. Heid,** who recently was transferred to Houston. Rogers has been with Shell since 1936.

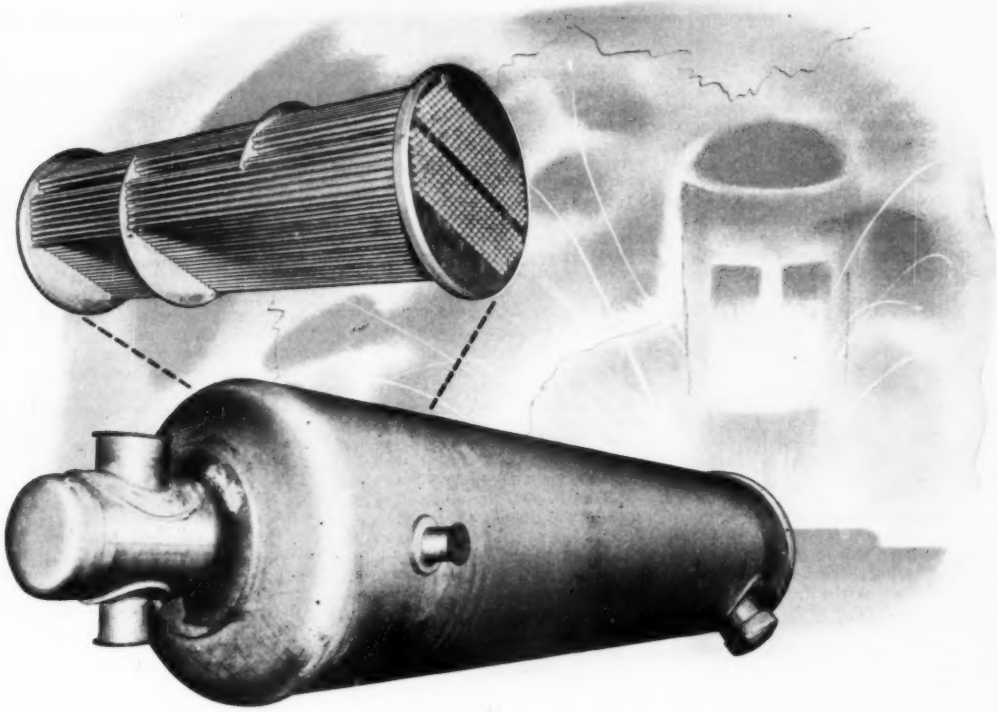
Ronald Pruet has joined Gulf Oil Corp.'s production department as engineer, headquartered at Hobbs, N. M.

DR. A. B. BRYAN

Dr. A. B. Bryan, Tulsa, chief geophysicist for Carter Oil Co., has been transferred to the production-research department, Standard Oil Development Co., in New York City. He will work on the coordination of research activities in the field of oil finding and oil production. Previous to his entering the oil industry as chief of research for Carter in 1935, Dr. Bryan served as an instructor at Rice Institute, Houston, of which he is a graduate. He received his Ph.D. in physics in 1922.

Graydon H. Laughbaum, formerly district geologist for Sinclair Oil & Gas Co., Oklahoma City, has been promoted to research geologist for the central division.

W. H. Loomis has been named superintendent of the Ventura district at Santa Paula, Calif., for The Texas Co., replacing **R. L. Jackson,** who be-



LOOK AT THIS THING—IT HOLDS A RARE SKILL

A vessel welded of two-inch aluminum was desirable for many processes before anyone could produce it. Only within the last two years was this skill mastered. Stacey Bros., a Dresser company in Cincinnati, pioneered in the welding of thick aluminum and, today, fabricates and welds up to 3½" plate. Whether the materials are aluminum, steel or steel alloys, Stacey Bros. can fabricate them for as difficult problems as can be solved anywhere.

The welded vessel shown has 1¼" walls with a second vessel inside having 2" walls. Stacey Bros. made it for McCarthy Chemical Co. This unique skill in welding resulted from two years' research with Battelle Institute. And from years more at Stacey Bros., including the invention of a new torch using a shield of argon gas.

The ownership of such unrivalled facilities, and such pioneering skills, is the reason why—The Biggest Jobs Are Going to Dresser. What problem have you in construction of large vessels? Write inquiries about large welded vessels and tanks to Dresser Industries, Inc., Terminal Tower, Cleveland, Ohio.

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ROOTS-CONNERSVILLE Blower Corp.
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THE ONLY COMPANY DOING AN OVER-ALL JOB—

From well to refinery
for the Oil Industry—
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for the Gas Industry

DRESSER INDUSTRIES, INC.
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PERSONALS

comes superintendent of the Los Angeles Basin district at Signal Hill, in an exchange of the two positions. **T. R. Beauchamp** has been appointed assistant superintendent of the basin's production, gasoline, and drilling operations.

C. F. Gearhart, Jr., hydraulic engineer for Stanolind Pipe Line Co., Tulsa, has been promoted to senior engineer, and **W. L. Kennedy,** engi-

C. F. GEARHART

W. L. KENNEDY

neer, has been named hydraulic engineer replacing Gearhart. Gearhart, whose promotion fills the vacancy created by the transfer of **H. L. Drake** to head Stanolind Pipe Line's newly created purchasing department, will have charge of architectural, hydraulic, and mechanical engineering for the firm. Kennedy has been in the engineering department since 1946, during which time he spent 1 year in the pipe-line department of Standard Oil Co. (Ind.) in Chicago. He recently has been in charge of coordination of the casinghead program of Stanolind Pipe Line. Gearhart joined the firm in 1946 after having served in the Canal Zone for 5 years on problems involving underground oil storage, connection lines for oil, and erection of tank farms.

Neal B. Prichard, Anderson-Prichard Oil Corp., Oklahoma City, has been elected a director of the company to fill the vacancy created by the death of L. H. Prichard.

Thomas D. Barber, geologist, Stanolind Oil & Gas Co. who has been working on geophysical coordination, has been transferred to Corpus Christi, Tex., where he will work on subsurface exploration.

P. E. Reeves, superintendent of the Bush Mountain, Tex., district for Pure Oil Co., has been transferred to Snyder, Tex., as superintendent of the North Snyder district.

N. G. Stewart, formerly in the proration department of the Oil and Gas Division, Texas Railroad Commission, has joined the staff of North Basin Pools Engineering Committee, Midland. He is a graduate of University of Texas.

E. H. Leeman, exploitation engineer, regional production department, Shell Oil Co., Inc., Houston, has been named a representative to train for 6 months with de Bataafsche Petroleum Maatschappij, The Hague, Netherlands. His appointment resumes that phase of Shell's training program which provides for experience in the company's foreign offices. While in The Hague, Leeman will observe general engineering practices with the production department. **H. J. W. Ten Broeke** has joined the regional production group in Leeman's absence, transferring to Houston from Wichita.

J. R. Britt, recently with the manufacturing department, Petroleum Advisers, Inc., Cities Service Co. affiliate, has been transferred from New York to Shreveport and promoted to assistant general superintendent of the natural-gasoline division of Arkansas Fuel Oil Co.

Arthur J. Smith, formerly engineer for the North Texas district, Panhandle Producing & Refining Co., has been named engineer for the company's properties, with headquarters in Dallas.

Dan F. Kralis, formerly chief geologist for Petroleum Exploration Co., has been named manager of exploration and assistant to the president of Sunland Refining Corp., Fresno, Calif. He will be in charge of the production and geological departments, and will direct all exploration work for the company, which is now active in Canada, the Rocky Mountain area, Texas, and California.

W. Ed Leroux, drilling superintendent for Carter Oil Co. at Oklahoma City, has resigned to join C. L. McMahon, Inc., Tulsa, as production manager. He joined Carter in 1933, and served in various capacities, including those of division engineer, district superintendent, and assistant production manager. In 1938 he served as field superintendent for M.A.O.R.T., Hungarian affiliate of Standard Oil Co. (N. J.). **Sam Wells,** Tulsa, formerly geologist for Shell Oil Co., Inc., and manager of explorations for Ashland Oil & Refining Co., has joined the McMahon firm as exploration manager. He was instrumental in Ashland entering the Mid-Continent area and in 1943 established a regional office in Tulsa where he supervised Ashland's activities.

Dr. Howard L. Yowell, Standard Oil Development Co.'s Esso Laboratories, Linden, N. J., has been elected president of Esso Research Club. Other officers include: **Harry T. Rice,** Esso Standard Oil Co., and **Dr. Carl S. Carl-**

:cn, Standard Oil Development Co., vice president; **Herbert L. Minich,** Esso Standard, secretary; and **Dr. Leonard E. Moody,** Standard Oil Development, treasurer.

Marshall J. Waters, senior engineer of products application for Shell Oil Co., Inc., has been appointed manager of products application, with headquarters in San Francisco.

F. C. King, formerly refinery engineer at General Petroleum Corp.'s Torrance, Calif., refinery, has been named assistant manager of the company's engineering department.

C. W. Reith, vice president in charge of production for Standard Oil Co. of Texas, Houston, is now administrative assistant in charge of production of subsidiary companies for Standard Oil Co. of California, San Francisco. He has been succeeded in Houston by **Don Domercq,** who formerly was Standard of Texas, chief engineer.

H. R. Thompson has joined Shell Oil Co., Inc., as exploitation engineer on the regional staff in Houston. Other new employes of the regional office include: **W. C. Abbott,** seismologist assistant, Corpus Christi, Tex.; **T. E. Mayhew, E. C. Philpy,** and **E. S. Ryan,** geologists; **W. O. Wottlin,** geophysicist; and **E. B. Lagucki,** mechanical engineer, all of Houston.

F. C. SEALEY

F. C. Sealey has been elected a vice president of the Bahrein Petroleum Co., Ltd., in charge of producing and exploration with headquarters in New York. He is also executive vice president of American Overseas Petroleum Co. A native of Denver, Sealey entered the industry 32 years ago as a geologist and for the past 11 years has been associated with foreign producing activities. **E. A. Skinner,** formerly a vice president of Trans-Arabian Pipe Line Co., also has been elected a vice president of Bahrein Petroleum. He will be in charge of government and public relations in the Persian Gulf with offices at Manama, Bahrein.

Rolf H. Hemmerich, chief technologist for Martinez Chemical Co., has been named senior technologist in New York City for Shell Chemical Corp. **Irving I. Schultz,** chief technologist at Shell Point, Calif., has been promoted to technologist at Martinez Chemical replacing Hemmerich.

D. T. Reed, rig-building foreman for Big Lake Oil Co., has joined Plymouth Oil Co. on the company's Olson lease in Crockett County, Texas.

Dr. Leo Broussard, formerly assistant professor of physics, Louisiana State University, has been named physicist at Esso Laboratories, Baton Rouge refinery, replacing **Dr. Z. W. Wilchisky,** who transferred to Standard Oil Development Co., Esso Laboratories Research division at Linden, N. J.

Patrick D. Hishon, engineer for Shell Development Co., Emeryville, Calif., has been promoted to engineer in the San Francisco area.

George E. Conner, engineer for Humble Oil & Refining Co., has joined Sun Oil Co. at Silver, Tex., as compressor engineer.

C. T. Helm has been elected a member of the board of directors of International Petroleum Co., a Jersey affiliate. Helm returned to the United States last October after 28 years of foreign service with Jersey Standard and affiliates, during which he resided in most of the countries of Latin America.

SHIFTS—

D. S. Johnston, superintendent, Signal Oil & Gas Co., Lomita, Calif., to Rolling Hills, Calif.; **Leland V. Gefvert,** engineer, Amerada Petroleum Corp., Rio Vista to Fresno, Calif.; **James H. Richards,** refining engineer, Standard Oil Co. of California, Richmond to San Pablo, Calif.; **James L. Yates,** engineer, Rosenberg to Aransas Pass, Tex.; **Bowmar Waters,** superintendent, E. K. & E. M. Burt, Goman to Coleman, Tex.; **E. D. Lambeth,** superintendent, National Association Petroleum, Harrold, Tex., to Fairfield, Ill.; **Robert H. Martin,** geologist, The Texas Co., Amarillo to Abilene, Tex.; **Dewitt L. Potter,** geologist, Phillips Petroleum Co., Amarillo, Tex., to Calgary, Alta., Canada; **S. E. Green,** foreman, Skelly Oil Co., Bay City, to Francitas, Tex.; **Walter W. Florence,** engineer, J. S. Abercrombie Co., Conroe, Tex., to Houston.

Jeff J. Shipps, geologist, Shell Oil Co., Inc., Corpus Christi to Houston; **George W. Atchley,** engineer, Republic Natural Gas Co., Dallas to Taft, Tex.; **Louis A. Williams,** geologist, Sun Oil Co., Dallas to Midland, Tex.; **E. E. Byrd,** engineer, Humble Oil & Refining Co., Freeport to Baytown, Tex.; **G. W. Hacke,** engineer, Humble Oil & Refining Co., Freeport to Baytown, Tex.; **Miss E. M. McKee,** geologist, Arabian American Oil Co., Houston to Dhahran, Saudi Arabia; **J. Van Der Lely,** engineer, Shell Caribbean Petroleum Co., Houston to Cabimas, Venezuela, S. A.; **Byron W. Berthelot,** engineer, Phillips Petroleum Co., Odessa to Borger, Tex.; **H. W. Maris,** engineer, Gulf Oil Corp., Ozona to Pecos, Tex.; **Arthur A. Moore, Jr.,** geologist, Humble Oil & Refining Co., San Angelo, Tex., to Albuquerque; **Vern D. Curry, Jr.,** engineer, Shell Oil Co., Inc., Houma, La., to Ennis, Tex.; **Harvey J. Wier,** engineer, Trans-Gulf Development, Inc., Opelousas, La., to New Orleans;

L. F. Fischer, engineer, Sohio Petroleum Co., Shreveport to Lafayette, La.; **C. K. Seaman, Jr.,** foreman, Humble Oil & Refining Co., Everglades, Fla., to Wink, Tex.; **F. M. Carroll,** engineer, Shell Oil Co., Inc., Marshall to Centralia, Ill.; **R. A. Hogue,** refining engineer, Sinclair Refining Co., East Chicago to Hammond, Ind.; **Donald W. Heil,** engineer, Sohio Petroleum Co., Covington to Kenton Vale, Ky.; **R. B. Davidson,** refining engineer, Sun Oil Co., Troy, N. Y., to Camden, Me.; **James C. Burtner,** engineer, Phillips Petroleum Co., Wooster, Ohio, to Texhoma, Okla.; **Nicholas Balai,** refining engineer, Refinery Engineering Co., Baxter Springs, Kans., to Chicago; **R. M. Graves,** engineer, Cities Service Oil Co., Satanta, to Pampa, Tex. **Preston G. Rennie,** engineer, Sohio Petroleum Co., Russell to Gorham, Kans.; **J. H. Watson,** engineer, Union Oil Co. of California, Cut Bank, Mont., to Whittier, Calif.; **W. C. Lehman,** engineer, Aberdeen, Wash., to Calgary, Alta., Canada; **S. C. Sandusky,** engineer, Ohio Oil Co., Lance Creek to Casper, Wyo.; **W. G. Middleton,** refining engineer, Phillips Petroleum Co., Bartlesville, Okla., to Bay City, Tex.; **Arnold G. Baker,** engineer, Carter Oil Co., Tulsa to Great Falls, Mont.; **William C. Wunnicke,** engineer, Stanolind Oil & Gas Co., Tulsa, to Brownfield, Tex.; **F. S. Nesmith, Jr.,** engineer, Stanolind Oil & Gas Co., Beaumont, Tex., to Tulsa.

DEATHS

Gov. Beauford H. Jester of Texas, 56, leader in the fight to assure rights of the tidelands for the states, and one of the leading opponents to federal encroachment in the oil industry, died July 10 in Houston. He was a member of the Texas Railroad Commission, and at one time served as that body's chairman. A native of Corsicana, Tex., the governor was widely known in the oil industry. He fostered a number of important oil and gas-industry bills in the Texas Legislature which were passed recently.

George E. Mattingly, 49, shareholders' representative in Switzerland and Algiers for Standard Oil Co. (N. J.), died July 4 in New York. Mattingly had served the company in Yugoslavia, France, England, and Romania, and during the war, was on duty with the Board of Economic Warfare.

E. N. Barnett, 60, Denham Springs, La., veteran refinery guard at Esso Standard Oil Co.'s Baton Rouge, La., refinery, died June 20.

Gilbert D. Starr, 58, stillman in the cracking-coils department, Esso Standard Oil Co.'s Baton Rouge, La., refinery, died June 15.

Capt. V. H. Wilhelm, 64, inspector of Naval Petroleum Reserves in California, died July 7 at the U. S. Naval Hospital, Long Beach, Calif. Representing the Navy, Capt. Wilhelm was prominently connected over a period of several years with the development of the Navy Reserve at Elk Hills, Calif.

Charles E. Chapell, 42, formerly with Sinclair Prairie Oil Co. and later an independent broker, died in Oklahoma City June 27.

Joseph Dark Adams, 73, pioneer oil driller who worked on the first well drilled at Spindletop, died July 7 in Beaumont, Tex.

Ross Robertson, 62, formerly associated with R-M-F Oil Co., died in San Antonio, Tex., July 2.

Homer A. Stillwell, 28, scout for Stanolind Oil & Gas Co. at Midland, Tex., died July 7.

James W. Jacob, line walker for Esso Standard Oil Co., Baton Rouge, La., died June 21.

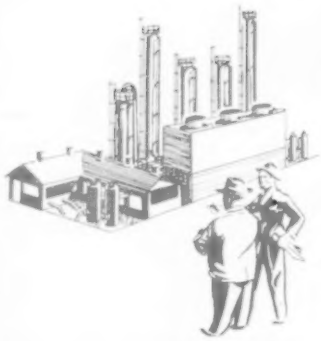
T. J. O'Rourke, 67, pioneer oil driller formerly associated with the firm of Fred O'Rourke & Sons, died in Pampa, Tex., July 4.

H. S. Vaughn, 54, representative for National Supply Co. in Fort Worth, died July 4.

James H. Sullivan, 62, Wichita Falls, Tex., oil operator, died July 3.

R. H. Frizzell, independent oil operator of Athens, Tex., died July 1.

Partial view of central shop during a recent open house



MAINTENANCE

by J. A. Oslin*

A REFINERY MAINTENANCE program of several years' standing is now returning substantial mutual benefits to both labor and management at Magnolia Petroleum Co.'s Beaumont refinery. The 150,000-bbl. refinery is one of the oldest on the Gulf Coast, and like most major domestic plants, it expanded over the years without the benefit of long-term integrated plans which are possible in newer installations.

Most of these inherited disadvantages are rapidly disappearing under the provisions of a general plan for improving the working conditions of all refinery personnel. New buildings and units conform to the over-all objective of promoting more pleasant surroundings, and the plant site as a whole is undergoing material improvement.

Maintenance personnel share substantially in better working conditions attending the modernization plan. In addition, all functions of maintenance have become organized and simplified, with both company and employes sharing in the returns from improved efficiency and productivity.

At Beaumont the necessity for an integrated maintenance program was recognized in the early 1940's as processing became more complex and as the cost of maintaining safe uninterrupted operation became an interesting factor in over-all plant economy. A master plan was then proposed and plant maintenance began gradually to be integrated under the direction of one responsible office. General acceptance of changes in many practices of long standing followed increasing proof of the project's efficiency.

Although interrupted to some extent by emergency wartime operations, the over-all plan is now approaching full development. Like all progressive programs, however, it undergoes continuous revision and expansion, which evolution will probably continue indefinitely.

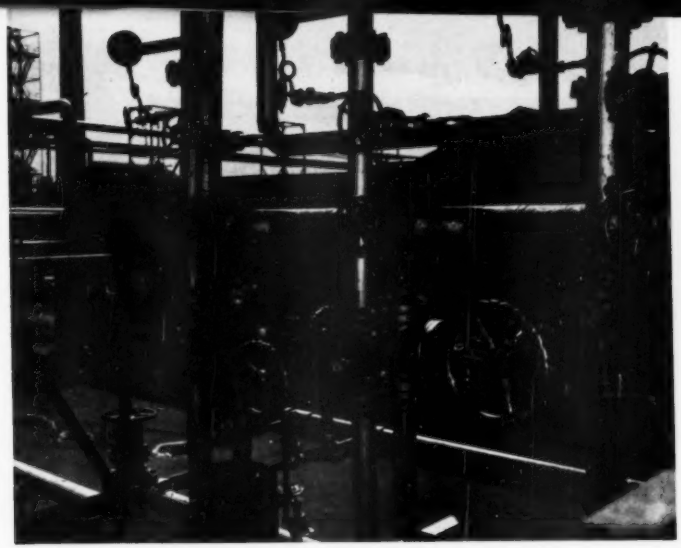
The program encompasses all phases of maintenance; of preventive, corrective, routine, and emergency or special natures. It has brought about many changes in the plant, both visual and unseen. It has introduced many new tools and techniques to lighten and speed maintenance work. Under its provisions, new methods and devices have been promptly evaluated and many of them accepted.

The Penetron, a nondestructive means for determination of metal thickness

Planning and Scheduling

Administration is an important factor in the program's success. Closer control of maintenance expense throughout the refinery has resulted from a planning and scheduling procedure set up on a plant-wide basis. Maintenance planning is done by all departments. In cooperation with the engineering department, the mechanical division so acts that planned projects are translated into clear-cut maintenance instructions to

*Magnolia Petroleum Co., Beaumont, Tex.



Decoking manifold on a major process unit

PROGRAM .... in a major refinery

foremen supervising actual work. The necessary work is scheduled in sequence of need and craft requirements and authorized in the form of work orders.

Cost Control, Work Orders

The cost-control system for work orders, in effect for many years, has recently been revised to improve its use as a major tool in the daily planning of mechanical work. Previously, work-order systems were historical in nature, showing only where maintenance man-hours were expended. Now the system not only furnishes a record of work done, but provides a forecast of future allocations for all mechanical manpower.

Individual work orders in six copies are now prepared for each refinery job involving construction, maintenance, repairs, and general servicing. For routine servicing of equipment and general maintenance, department heads prepare standing work orders. All work orders are forwarded to the general mechanical foreman of the mechanical division. An up-to-date list of all refinery equipment and facilities shows who is responsible for each item. This list is consulted to determine who shall open each work order.

Work orders are issued as far in advance of actual work as practicable. Except in special cases, noon is the deadline set for receipt of an order by the general mechanical foreman for work to begin the following day. This enables proper assembly of all work orders for preparing daily work schedules in advance.

Jobs requiring attention immediately or during the current day may be sent or telephoned to the work-order unit of the planning and scheduling section between 8 a.m. and 5 p.m. on working days, and to the tool room at other times. A work order is promptly prepared from the information forwarded.

The planning and scheduling section posts on each retained work order copy, the time expended by all crafts on each particular job. Also listed are materials or supplies which may be causing delay through short supply or unavailability. This system provides the section with a basis for daily review of all jobs from which subsequent work may be scheduled.

Engineering Functions

The engineering department plays an important part in maintenance under the new program. On a routine basis it now handles the systematic inspection of equipment and facilities, the study of special problems, the mechanical testing of equipment and materials. Maintenance problems involving engineering are handled in three zone engineering offices set up in the plant. The construction section of the department now takes an active part in maintenance jobs requiring civil engineering. Maintenance problems involving such equipment items as tanks, heat exchangers, pumps, and pressure-relieving mechanisms are now handled by several engineering specialists. In addition, a special-projects group has been organized to evaluate labor-saving devices, to recommend improvements of maintenance facilities, and in general to expedite the maintenance program in the refinery.

Major Projects

Major expense work, which requires management approval, concerns several departments at the refinery. Requests for such projects are transmitted to the engineering department where each job is investigated, estimates are prepared, and where possible, expenditure-payout period is determined and presented to management for decision.

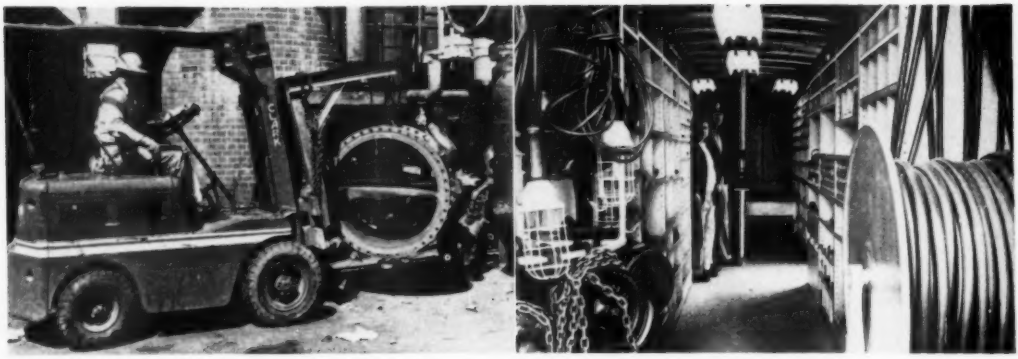
Upon approval from management, the accounting department certifies the job as to class and the engineering department prepares drawings, performs any required engineering, and orders materials. The planning and scheduling section of the mechanical division then takes over for work planning. Work orders are opened, a job sequence by proper craft is drawn up, applicable drawings are listed, necessary materials are located, and correct charges indicated. The job is then scheduled and the plans are released to the crafts concerned for execution.

Progress reports on this class of work are maintained by the engineering department and checked at least weekly by the zone engineers. When a job is completed the accounting department again enters the picture with a report of the job closing. This is analyzed by the engineering department which explains to management any deviations from original estimates on cost, etc. Where a job payout period was estimated, the economics department investigates some time after job completion and prepares a report on expenditure and indicated payout as compared with estimates originally drawn up.

Equipment Materials

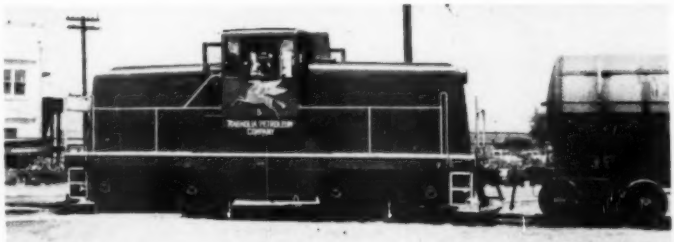
A major project of the maintenance program is the gradual renewal and relocation of plant facilities to promote more efficient future maintenance. The same policy is applied to new process units installed at the expanding refinery. This phase is two-fold. It calls for wider acceptance of newly developed materials which will stand up longer in service, thus requiring less attention and fewer repairs and replacements. It also concerns better design and layout of all facilities to simplify inspection, repair, and replacement.

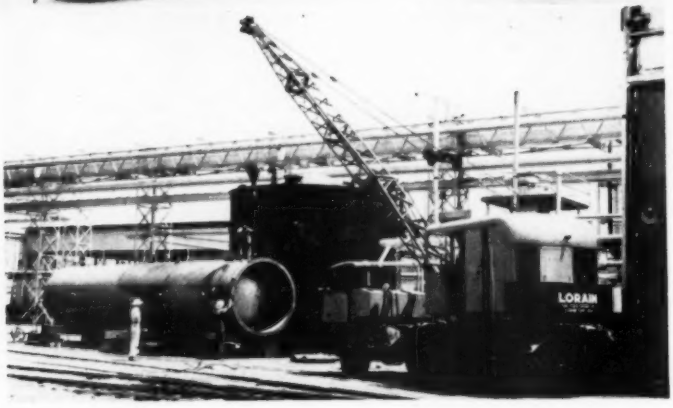
The emphasis on metals of high resistance to corrosion and wear is now proving sound, with improved service outweighing higher initial

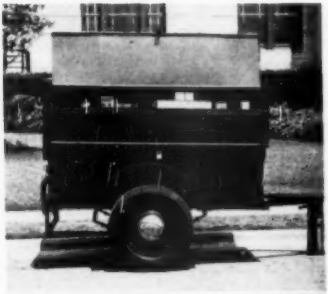


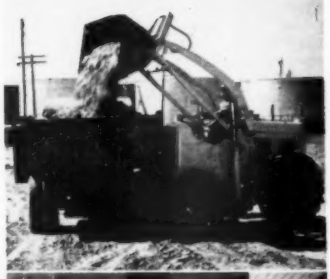
PORTABLE MAINTENANCE EQUIPMENT SAVES TIME AND MONEY

at Magnolia Petroleum Co.'s refinery at Beaumont, Tex.









cost. The individual adaptations of metals and alloys to new specific uses are too numerous to discuss here in detail. Monel metal, stainless steels, cast iron, cast nickel, Muntz metal, cast bronze, admiralty brass, naval rolled brass, and many other metals and alloys are now employed in lining, eletroplate, clad, metallized and solid form in many items of plant equipment. These include valves, fittings, lines, vessels, towers, exchangers, condensers, and pumps where the respective qualities of special metals have proved superior. Controlled by a reasonable budget, this changeover has progressed gradually as replacement of existing parts and equipment items became necessary.

Forty per cent of all tubular heat-exchanger bundles now in use consist of bronze alloy tubes. At the present stage of changeover, the application of engineering design knowledge has increased the average life of all exchangers 57 per cent since 1943. This record was made over a period which saw a 100 per cent increase in the processing of sour crude, and a general increase in the severity of operating conditions occasioned by record wartime and postwar product demands.

Paralleling the continuous conversion to more durable equipment and parts is a related trend toward standardization of fittings, parts, and accessories. This project will result in important reductions in inventory and at the same time simplify the work of repair and replacement.

Plant Layout Improved

The efficiency with which future maintenance may be accomplished is now an important factor to be considered in design and layout of new processing units. In addition, existing units are becoming equipped with facilities promoting easier inspection, repair, and replacement. This plan extends to major relocation of some plant facilities to conform to the future plan for reducing maintenance costs to a minimum.

New units are laid out for easy access to all sections. Extensive concrete paving allows much repair work to be done locally. Miles of new truck runways have been constructed through unit areas to facilitate easier loading and unloading of equipment.

Pull-through-type condenser and exchanger bundles which require only the removal of channels for pulling, are increasing in use. All condenser banks on some new units are served by overhead monorails, used with snatch blocks for pulling bundles. The I-beam monorails are placed as needed, in clips installed at both ends of such exchanger banks.

A major relocation of refinery pipe line has been long under way. Fifteen years ago all transfer and service lines were buried. Oil losses were high, and inspection, detection, and repair of line breaks proved costly. Raising of all such lines and relocation in elevated pipe right-of-ways was one of the early projects under the over-all program. As a result, the major rights-of-way are now established through the refinery and much pipe is already up. Lines are raised as their periodic inspection or renewal becomes necessary. Hence, completion of the program is several years off, but when accomplished it will have cost a minimum of expenditure and downtime.

Inspection Methods

An initial move during inception of the maintenance program was the development of organized corrosion inspection of all process equipment. Based on many years' experience, the present inspection schedule provids continuous routine checks of the entire refinery.

Inspection has been simplified by adoption of new methods and devices and by the reduced attention required of improved corrosion-resistant equipment. For example, use of the Penetron and Audigage for nondestructive thickness measurement of steel vessels has increased an inspection team's coverage 20-fold. This is particularly important during turnarounds when time is limited. The inspection program is not limited to corrosion. Check lists cover all phases of safety and housekeeping in the refinery, including fire-fighting installations, trash, scrap, salvage, and unused tools.

Turnarounds

One of the most profitable phases of the maintenance program concerns the planning of process-unit turnarounds. Complete and detailed preparations prior to the actual turnaround have proved invaluable for conducting inspections and making replacements in a minimum period. The present schedule is the result of several years' development.

All turnarounds are scheduled tentatively 1 year in advance. The assistant general superintendent in charge of the process division calls a monthly meeting at which down time for specific units is fixed for the subsequent 30-day period. Present at the meeting are representatives of the technical and operating departments and the maintenance section of the engineering department.

Once a specific turnaround date is set, requests for work to be done during the down-time period are forwarded through the general superintendent's office to the maintenance section. There a "tentative corrosion inspection and maintenance schedule" is prepared listing all proposed work to be done on the specific unit.

On receipt of this schedule, the general superintendent then holds a meeting of members of all departments concerned where each item of the schedule is discussed as to necessity, requirements, etc. A definite hour for shutdown is fixed to allow the process division time to prepare the unit for mechanical work. The corrosion inspection and maintenance schedule is then revised by the maintenance section and distributed to all concerned.

From this revised schedule, the planning and scheduling section of the mechanical division performs the following functions: (1) prepares a list of work which can be done before the unit comes off-stream, (2) lists tools and equipment to be taken to the unit before the down period, (3) prepares work orders for the separate classes of required work, and (4) draws up a chart of the work in sequence of need by craft requirement. At the same time the process division develops a procedure for releasing the individual pieces of process equipment to the mechanical personnel in a sequence which conforms to the manpower allocation plan.

Then follows a mechanical division meeting of job-level supervisors at which work details of the turnaround are explained and discussed. A mechanical work coordinator is designated for the turnaround. He is aided during the operation by maintenance engineers and representatives of the planning and scheduling section.

Work scheduling and proper meshing of jobs are responsible for material reduction in down time. During the development of the present work plan, the various jobs on turnarounds were plotted for study on a Productrol board. The curve showing manpower vs. time elapsed at first showed a slow rise at the beginning of a turnaround and a tapering off at the close of the period. By coordinating all crews and scheduling certain jobs for earlier beginnings, the low employment periods were eliminated, resulting in a higher manpower rate throughout the operation.

Besides adding to the stream-day capacity of processing units, this plan has resulted in a 15-30 per cent reduction in total man-hours required to turn process units around. In addition, improved methods for routine inspection, better materials and more thorough turnaround renewals have combined to increase productive capacity of many process units by extending their operating periods between turnarounds. For example, a Cross unit formerly turned around each 90 days is now considered for 150 days of continuous operation before coming down. A combination unit formerly cleaned every 90 days is now cleaned at 150-day intervals.

Improved Maintenance Methods

New maintenance practices have received prompt evaluation and adoption where proven feasible. An example is the cleaning of oil-furnace tubes. Coke burning has replaced mechanical cleaning in many furnaces. The new practice has several advantages. It is done in a fraction of the time formerly required, reducing

(Continued on page 101)

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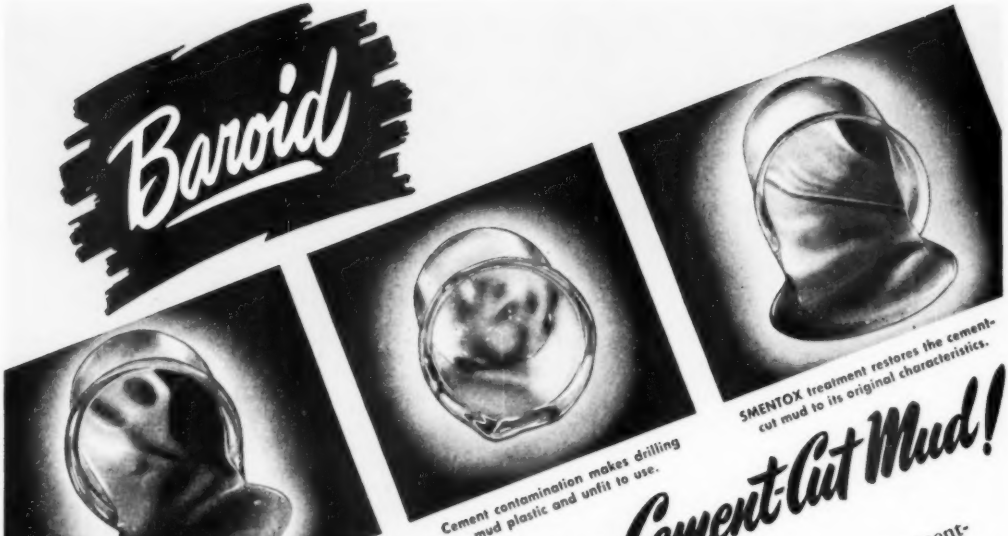

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Worland Field Development

High H_2S content of gas with its attendant hazards is only one of the problems operators in this field have had to cope with, but all have been successfully handled

by Neil Williams
Associate Editor

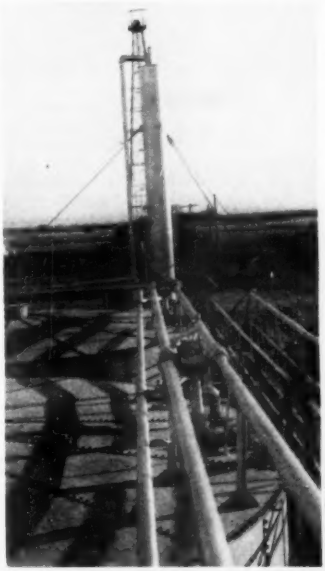
DEVELOPMENT of Worland field in Washakie County, Wyoming, has presented a combination of unusually difficult problems. Complicated by the hazards associated with the production and handling of gas containing an exceptionally high concentration of hydrogen sulfide (approximately 38 per cent), they have taxed the ingenuity and resourcefulness of operators to overcome them.

Opened in March 1946, the field now has 20 producing wells, of which 13 have been completed by Pure Oil Co.; 3 each by Trigood Oil Co. and Sharples Oil Corp., and 1 by Carter Oil Co. Present wells extend production a distance of 5 miles along the crest of an elongated northwesterly-southeasterly trending structure. So far productive limits have not been defined in any direction. Currently drilling are three wells by Pure, two by Trigood, and one each by Sharples and Carter.

Productive horizon is the Embar lime encountered at drilling depths of from approximately 10,000 to 10,200 ft. Saturation occurs in fractured zones. The degree of fracturing, a factor in well productivity, varies considerably in different parts of the field and from well to well. In the more fractured zones, prevention of mud losses and possible resulting blowouts has been a major drilling problem. In view of the highly poisonous gas which might spread over the area, a blowout in this field would be a potentially greater hazard than in most fields.

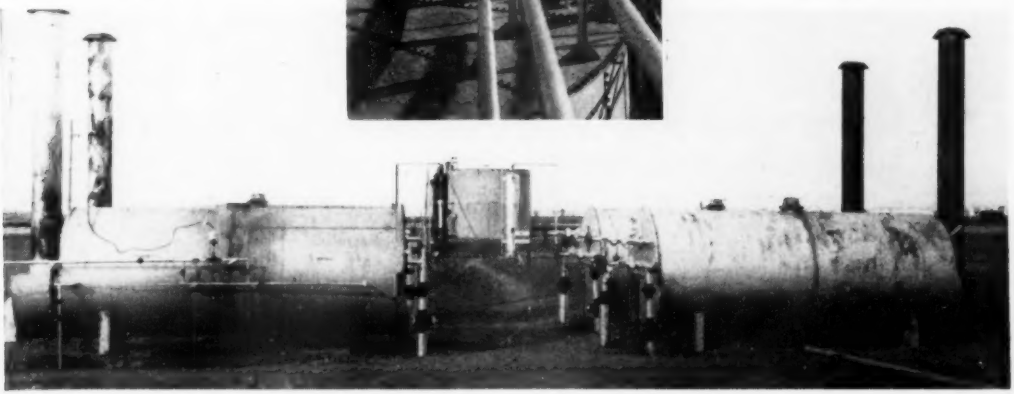
Gas is produced with the oil in widely varying ratios, ranging from as low as 2,400 cu. ft. per barrel in one of the lowest structural wells to as high as 10,000 cu. ft. per barrel in highest wells. So far no true gas cap has been found and no determination of a gas-oil contact has been possible. Bottom-hole pressures are in the order of 4,400 to 4,600 psi. and are reflected in flowing pressures up to 2,000 psi., depending on gas-oil ratios and rates of withdrawals. As in the case of gas-oil ratios, oil production varies with the structural position of the wells. Gravity in the lower wells is as low at 27.5° A.P.I. and ranges up to 45.9° A.P.I. in the highest.

Bottom-hole temperatures run about 200° F., but in producing the wells expansion of the gas with pressure



Below: Standard heater installation by Pure Oil Co. in Worland field. Two heaters at left, each having dual coils, are on flow line from well to separators (center background). Heaters at right are for circulating hot oil behind tubing in well

Left: Tank-battery vent system showing paralleling main 4-in. vent line (right) and 3-in. bypass vent line (left) with two-way opening valve to them from tank vent outlet. The third line (left and below bypass vent) is 3-in. oil fill-up line from 1-oz. gas stripper (vertical vessel at end of battery)



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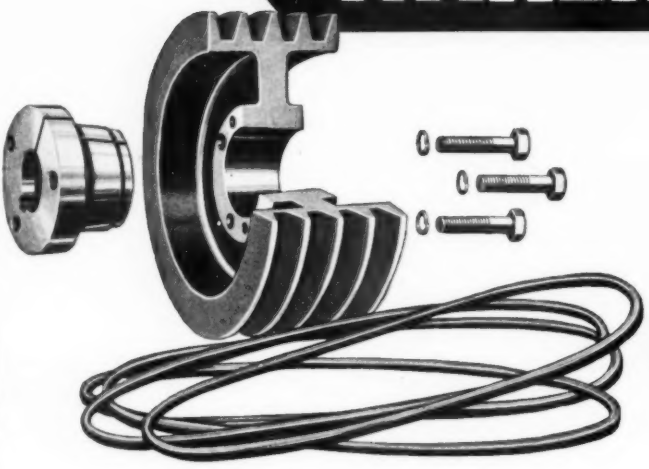

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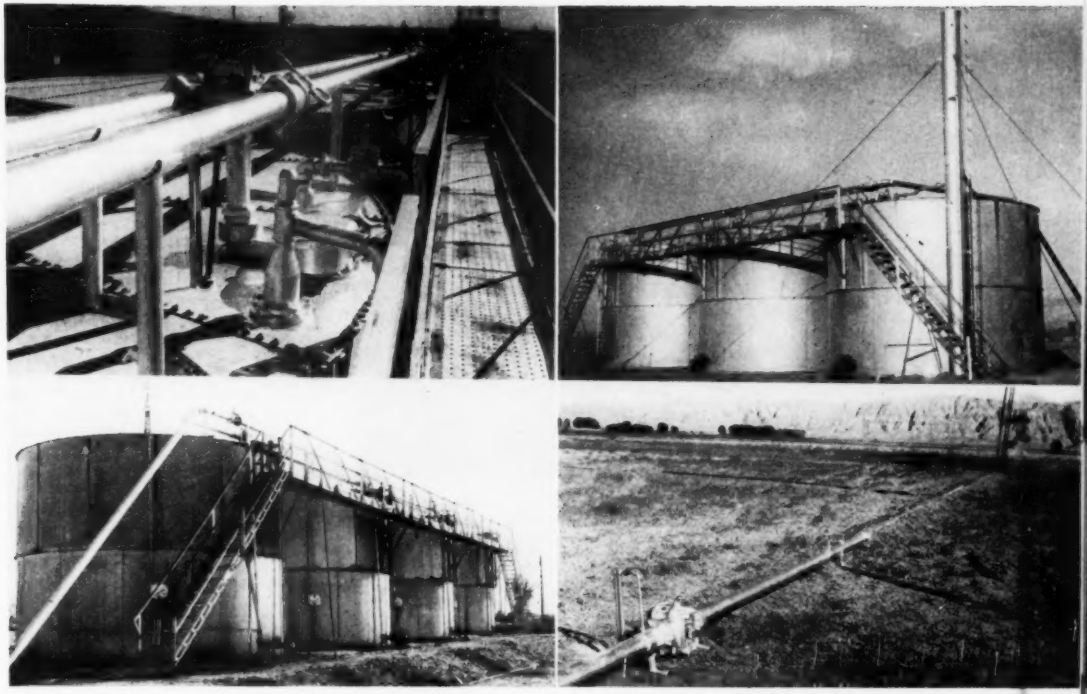

Upper left: Vent-outlet installation on lease tank in Pure Oil Co. battery showing two-way opening and closing alternately to main 4-in. vent line (foreground) and 3-in. bypass vent line (rear). Thief hatch can be opened only after closing valve to main vent line and opening it to bypass line. Upper right: Pure Oil Co. tank-battery installation at Worland showing 1-oz. gas stripper (foreground). Stripper removes all gas down to 1-oz. pressure from oil stream from 50-psi. separator, and thus minimizes vaporation in tanks. Visible at tank-top level is oil fill-up line leading from stripper to tanks. Stripped-gas vents to main vent line from tanks on which vacuum is pulled. Note also catwalk with stairway at each end. Lower left: Tank-battery installation on Pure lease showing liquid-level gages on sides of tanks. These gages are provided to avoid the necessity for going to tops of tanks and opening thief hatches. Showing is main vent line leading from top of battery with 3-in. bypass vent line connection at point on down side of one 2-oz. back-pressure valve. Newer batteries are equipped with 1-oz. gas stripper on oil inlet. Lower right: Vacuum is pulled on vent line from tank battery to flare by injection of high-pressure gas. Shown in center of picture is small bypass line leading from separator vent to jet in 6-in. vent line from tank battery. Check valve (foreground) is on upstream side of jet and prevents back flow of high-pressure gas to tanks

reduction lowers the temperatures, unless artificial heat is applied, to a point that hydrates readily form and quickly freeze in the wells and lines. The exceptional hazards which would be faced by operators while working in and around wells with extremely poisonous gas and high pressures to thaw and clean out the ice greatly accentuate the necessity of preventing hydrate formation and freezing in this field.

Heat is necessary not only for the expansion of the gas in the lines from the wells to the separators but also for the inside of the wells. Heat for the inside of a well is supplied by circulating hot oil behind the tubing through an auxiliary string of 5-in. pipe. Approximately 3,500 ft. of this pipe is used, placing the bottom at a depth below where there is potential danger of freezing in the tubing. The string is hung inside the well with bottom and annulus open, permitting return of the hot oil to the surface through the 7-in. casing.

In the length of the circulating string, operators have been governed by the experience with freezing which was gained in the discovery well. In early attempts to complete and produce that well, before heating was resorted to, freezing occurred to depths as great as 3,000 ft. On one occasion, the well froze solid both in the tubing and in the annulus. Although freezing difficulties in that well were accentuated by exceptionally high gas-oil ratios and breaks and leaks which developed in the tubing, allowing gas to expand into the annulus, the extra-long circulating string is provided as an additional safeguard and precaution.

Hot Oil Circulation

An individual circulating system is provided for each well. Circulating oil is returned through the 7-in. casing flows to a surge tank. From there it is picked up by a small, motor-driven pump and passed through two double-coil, horizontal gas-fired heaters to the inlet of the 5-in. casing head. The surge tank is 8 ft. long, 5 ft. wide, and 5 ft. high, giving it a capacity of approximately 36.6 bbl. Although covered, the roof is left unsealed so that in the event gas or production oil should enter the 7-in. casing through some leak or break and flow into the tank it would be released over the top of the tank. Possible back flow through the heaters and pump is avoided by a check valve in the line to the 5-in. casing.

Temperature requirements for the circulating oil vary with the individual wells. They are dependent to a large extent upon the gas-oil ratio or the producing rate of the well. To prevent hydrate formation, temperature of the well production must be maintained at not less than 90° to 100° F. Some wells with relatively high ratios may require the circulating oil to be heated to temperatures up to 150° to 160° F. Low-ratio wells may need very little heating, and possibly none part of the time. Circulat-

Pump installation provided by Pure for circulating hot oil behind tubing in well to prevent hydrate formation. Circulating oil is picked up from special surge tank (right) and pumped through two heaters in succession

ing rates range from 35 to 40 bbl. per hour.

Flowing pressures from the wells to the separators are reduced in four stages through two 5-by-12-ft., double-coil, 7,500-psi-test, horizontal gas-fired heaters. Wells are produced through fixed chokes at the well heads with pressure reductions being controlled through long-nosed adjustable chokes installed in the inlets to the respective heater coils. No gas expansion occurs ahead of the first heater coil.

Although temperature and pressure control in the heater coils may vary for different wells and at different times, a representative operation is:

	Heater No. 1		Heater No. 2	
	Coil 1	Coil 2	Coil 3	Coil 4
Inlet choke size (in.)	25/64	25/64	38/64	53/64
Inlet temperature (° F.)	96	112	112	118
Outlet temperature (° F.)	112	112	118	98
Inlet pressure (psi.)	2,000	1,750	800	500
Outlet pressure (psi.)	1,750	800	500	300

Separation of oil and gas is in two stages, first at 300 psi. and, second, at 50 psi. back pressure. In addition, the more recent tank-battery installations have included an auxiliary gas stripper, operated at only 1 oz. back pressure. This has been designed to vent additional gas from the oil stream from the 50-psi. separator, and thus reduce the amount of vaporization in the tanks. Although the tanks are provided with special safeguards to prevent any accumulations of the hydrogen sulfide gas in them, the stripper is an extra precaution.

The stripper leg is 20 in. in diameter and 32 ft. high. The oil stream enters at a point about 6 ft. from the top through a riser from the 3-in. line leading from the 50-psi. separator dump. Oil leaves by way of an inside riser extending from near the bottom of the leg to the point of outlet to the 3-in. fillup line extending across the tops of the tanks. It enters the riser through perforations in the lower 5 to 6 ft., where static conditions prevail and, with fluid level higher than the fillup line, flows by gravity to the tanks. Gas is vented to the 4-in. vent line leading from the tops of the tanks to the flare.

Special precautions are taken to prevent any accumulations of hydrogen sulfide vapors and contact of oxygen with the vapors in the tanks. Tank vapors in excess of 1 to 1½ oz. of pressure are vented through a 4-in. line and back-pressure valve to a 6-in. flare line, on which a vacuum constantly is pulled. Vacuum in the latter line is supplied by a high-pressure gas jet, the gas being provided through a bypass from the vent line of either the 300-psi. or the 50-psi. separator. A check valve is placed in the 6-in. line on the upside from the jet to prevent back flow to the tanks.

Extra Tank Equipment

Tank batteries also are provided with a 3-in. bypass vent line which parallels the 4-in. vent line and ties into the latter on the downside of the 1-1½-oz. back-pressure valve in that line. This line is used to pull a vacuum on and remove all vapors from any tank desired when it is necessary to open the thief hatch. By this precaution, the hazard of an operator being overcome by poisonous gas when opening a hatch is avoided and the contact and mixing of air with tank vapors prevented.

The vent outlet of each tank in a battery is connected with both vent lines through a two-way-acting valve which automatically closes the outlet to one line when the other is open. Thus, when opening the valve to the bypass vacuum line, a tank is isolated from the main 4-in. vent line, preventing inlet of vapors vented from the other tanks. As an additional precaution, the thief hatch is locked to the vent outlet valve so that it cannot be opened until the valve is closed to the 4-in. line and open to the bypass.

A sweet-gas blanket at 1 to 1½-oz. pressure is maintained on any tank being emptied and while empty. This gas is obtained from the field's fuel distribution system supplied from a gas-transmission line which passes through the field. Pressure is controlled by a regulator at each tank battery and is adequate to keep air from entering the tanks and prevent accumulation of hydrogen sulfide vapors.

Although the tank vent system

Well hookup in Worland field providing for use of auxiliary 5-in. hot-oil circulating string of casing, hung in well to depth of 3,000 ft. Hot-oil inlet to 5-in. circulating string is shown at the lower left side of the installation

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minimizes the chance of operators being endangered by poisonous vapors when opening thief hatches or otherwise working at the tops of tanks, going to the tops of tanks is avoided as much as possible. Tanks are provided with liquid-level gages which can be read from the ground so that conventional gaging of tanks through the thief hatches is not regularly necessary. Anyone who has to go to the top of a tank is required to wear a gas mask. To facilitate getting off or on the tops of tank batteries in emergencies catwalks have stairways at both ends.

Both the high and low-pressure separators and the tank battery at each well are vented through individual flare lines which converge at a central location. Due to the high hydrogen sulfide content of the gas, flares burn with a bluish-green color which is virtually indiscernible in daylight, making it difficult to know whether or not a flare is lighted. In view of the hazard of venting poisonous gas without burning, each flare has a small pilot light fed from the field's sweet-gas supply and kept burning at all times. This insures automatic lighting and burning of the flare whenever any gas is being vented.

Sulfur Extraction Plant

Although gas currently is being vented without processing, construction is under way on both a sulfur-extraction plant and a gasoline plant. The sulfur plant will be operated by Texas Gulf Sulphur Co., Houston, and the gasoline plant by Pure Oil Co. Sufficient capacity is being provided to take care of all gas production in the field. With removal of the sulfur content and recovery of liquids, the residue gas then will be available to the gas-transmission line which passes through the field.

Control of gas pressures while drilling the producing zone is a major problem in the field. Pressures are not abnormally high and usually can be held with mud weighing as little as 9.6 lb. per gallon. However, due to the fractured condition of the formation, excessive mud losses may result with mud weighing as little as 9.8 lb. per gallon. This differential allows very little margin of safety and has necessitated extreme care and precautions in drilling to prevent blowouts, the hazards of which are greatly accentuated by the hydrogen sulfide gas.

Maintenance of this close control of mud weight is complicated by gas pressures in the shallower Frontier sands at depths of 7,000 to 7,500 ft., for which heavier mud may be needed, and by the red beds at 8,800 to 9,000 ft., which require special care in treating mud to prevent contamination. Consequently, in wells in those parts of the field in which more severe fracturing of the producing formation and difficulties in preventing circulation loses are expected, the practice usually is to run and cement the 7-in. oil string of casing before drilling into the zone. In areas where fracturing is not so bad and where the formation may be drilled with little or no trouble, open hole may be carried to the total depth before casing is run. In such wells, the casing usually is cemented through the producing zone and then perforated for the well completion.

Wells are started with from 80 to 100 ft. of 16-in. conductor pipe, cemented to the surface and, in most instances, with from 2,300 to 2,500 ft. of 10¾-in. surface casing, also cemented to the top. Longer surface strings, 3,250 to 3,500 ft., have been run in several wells. When cementing the 7-in. oil strings, operators try to get the cement up behind the pipe to a depth as high as 6,500 ft. to place it well through the Frontier gas sands.

Due to the hot-oil circulating string of casing, completion of wells is considerably more involved than in most fields, and necessitates extreme care and safeguards to insure control of pressures. Since the circulating string cannot be run until after the tubing packer is set, an extra trip is required for this purpose. This, with the running of the 5-in. circulating string and the complications it causes in cleaning wells, adds materially to time factor.

Essential steps in the completion procedure follow. After plug is drilled, the tubing packer is run in with setting tool on tubing or drill pipe. The packer is set about the middle of the bottom joint of casing above the producing section. The setting tool then is released and brought out of the hole. Next, the hot-oil circulating string is run. This string, as previously stated, consists of approximately 3,500 ft. of 5-in. pipe. It is hung and sealed in the casing head with bottom and annulus left open. Tubing then is run. Usually a tapered string, consisting of approximately 3,200 ft. of 2½-in. tubing on bottom and the remainder 2-in., is used. With a stringer on bottom, the string is run with tubing seal through the packer previously set.

Completion Practice

Next step is to displace the mud in the tubing and the lower part of the hole. With packer open, the tubing is circulated first with water, and then with oil to a point above the packer. Packer then is closed, and displacement of the mud in the annulus between the tubing and the 5-in. oil-circulating string and that between the latter string and the 7-in. casing undertaken. For this, circulation is started either through the 7-in. or the 5-in., usually the former. Mud first is displaced to a point near the bottom of the 5-in. string in one annulus, after which circulation is reversed through the other annulus, thus insuring more effective cleaning of both annuluses.

Wells are acidized before being brought in and tested. Generally about 10,000 gal. of acid is used for each well. This usually is administered in two successive treatments of 5,000 gal. each. The acid is preceded with about 10 bbl. of formaldehyde as an inhibitive. Wells usually unload and kick off naturally. However, considerable trouble often is encountered in cleaning out due to the presence of a heavy, thick and gummy substance, referred to locally as black mud. This is emitted in slugs, which have a tendency to plug the tubing and shut off the flow. Plugging has been so bad in some instances that tubing has had to be pulled to clean it out.

Presence and cause of the substance puzzled operators for some time. At first it was thought it might be contaminated mud left in the hole due to ineffective cleaning of the formation during displacement of the drilling mud. Some engineers speculated it might have been caused by action of the hydrogen sulfide gas on the casing. This, however, was discredited by the fact that the time interval after running casing was not sufficient for the gas to have any effect on the pipe. General belief now is that it is an iron oxide deposition accumulated over a period of time in the fractures in the formation and caused by reaction of the hydrogen sulfide on pyrites in the formation. Mixed with mud which finds its way into the fractures during drilling of the formation, it forms a sludge which remains in place until cleaning of a well is started and pressures force it into the well bore. Before a well can be placed regularly on production, it must be certain that all the sludge accumulation is removed from the formation.

Wells come in through chokes with potential flows ranging from 400 or 500 bbl. to as much as 1,500 bbl. per day. Current field production is from 8,000 to 10,000 bbl. per day. Although the gas has a high hydrogen sulfide content, sulfur content of the oil is not exceptionally large. Unlike the gas, the oil by itself is not particularly corrosive and presents no problems or hazards in its handling.

New Bulletin Is Published

"The Harang Fauna of Louisiana," first paleontological bulletin to be published by the Louisiana Geological Survey since 1942, has been issued, S. L. Digby, state conservation commissioner, announced. The report was prepared by David E. Pope and D. Jeter Smith under direction of the survey staff and Dr. H. V. Howe, director of the state university school of geology.

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W. F. RUSSELL — W. O. RUSSELL

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OIL OPERATORS, PRODUCERS AND CONTRACTORS
GAINESVILLE, TEXAS.

January 31st, 1949

Mr. H. R. Carlson, Ass't Dist. Mgr. Industrial
International Harvester Company
1809 South Lamar Street
Dallas, Texas

Dear Mr. Carlson:

On April 28th, 1948, we purchased our first UD-24 - 180 Horsepower International Diesel Power Unit, which was used to power a 6 x 12 Oil Well mud pump. To date we have drilled 15 wells with a total footage of 30,000 feet. No engine maintenance expense to date.

This UD-24 replaced an engine operating on butane. We find it cost us 33% less to operate your Diesel engine over our previous butane equipment. We also find you have a vibrationless engine and the easiest to start of any make engine we have ever used.

Our second UD-24 - 180 Horsepower International Diesel Power Unit was put to work on September 13th, 1948, and it is powering a 7-1/4 x 12 Gardner Denver mud pump and operating at a 600 pound maximum pressure. This unit was used in drilling 7 wells with a total footage of 13,300 feet to date. No maintenance expense on this engine as yet.

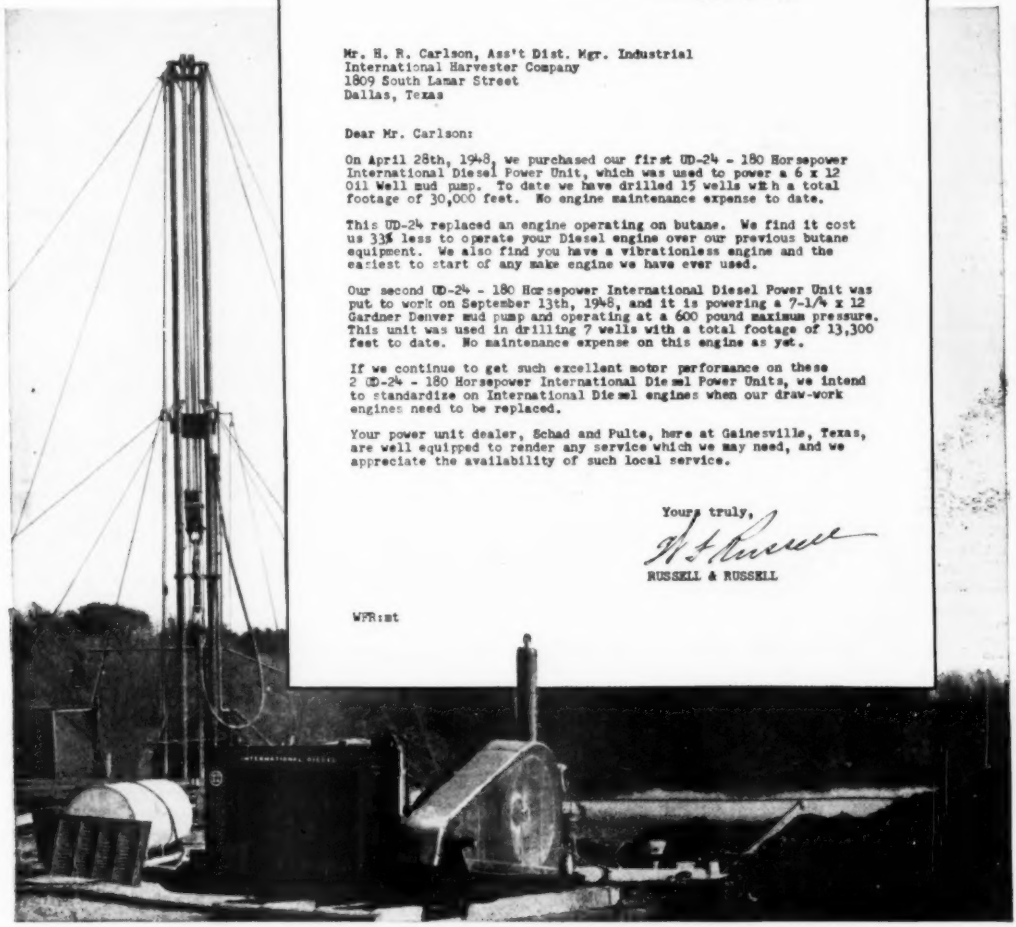
If we continue to get such excellent motor performance on these 2 UD-24 - 180 Horsepower International Diesel Power Units, we intend to standardize on International Diesel engines when our draw-work engines need to be replaced.

Your power unit dealer, Schad and Pulte, here at Gainesville, Texas, are well equipped to render any service which we may need, and we appreciate the availability of such local service.

Yours truly,

RUSSELL & RUSSELL

WFR:mt



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DRILLING and COMPLETING

UTAH'S DEEPEST PRODUCER

by J. W. Gibson*

COMPLETION of The California Co.'s Upper Valley No. 1 gives southern Utah its first relatively deep producer as well as the deepest producing well in the state. It is centrally located in the southern part of the state in SW NW Section 12, T36S, R1E, Garfield County, and has been drilled in the Kaiporowits basin. It is the first well in this geological province, and is completed in the Hermosa formation.

The structural feature on which the well is situated is known as the Upper Valley anticline, an asymmetrical, elongated fold with from 800 to 900 ft. of closure embracing 20 or more square miles. The axis trends northwest southeast with dips on the west flank averaging about 35°, while the east flank averages about 7°. (Fig. 2 illustrates surface structure of the area.) Sedimentary formations underlying the structure may reach a thickness of over 11,000 ft., ranging in geologic age from the Cretaceous (Mesaverde formation) exposed at the surface to the Cambrian at depth. For comparison, it may be said that, in general, the same geologic section underlies the well-known Rangely (Northwest Colorado) and Elk Basin (Northwest Wyoming) structures, except for differences in formation thicknesses and lithology.

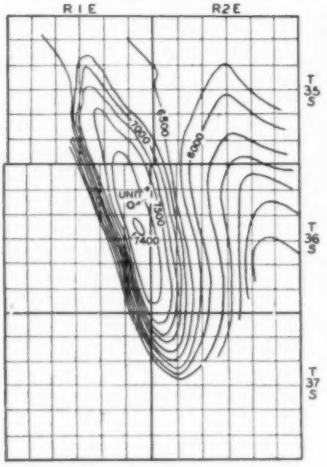

Fig. 2—Surface structure of Upper Valley anticline, contoured on surface sandstone member Mesaverde formation

A total of 516 days was consumed by continuous operations from the spud date, July 29, 1947, until the rig was placed on standby time, December 28, 1948, at a total depth of 8,857 ft. Twenty-four per cent of this total time was spent in drilling. Eleven and one-half per cent was spent in coring a total of 1,123 ft., of which one-third may be classified as drilling, since large-size diamond core heads were used to increase the drilling rate. Twenty-four per cent was dead time, which includes trips with the drill pipe, cementing surveys, and other routine work. Of the remaining, 19½ per cent was for fishing operations; 9 per cent reaming; 6½ per cent drill-stem testing, swabbing and pumping tests; 3 per cent for lost-circulation trouble; 3 per cent for repairs to the drilling equipment; and 6 per cent in waiting on material and services. Considering the remoteness and accessibility of the well location, the percentage of lost time spent in waiting on materials and services was comparatively small.

Drilling equipment used was of medium size, capable of efficient drilling to 10,000 ft. with 4½-in. drill pipe, diesel-electric powered, with two mud pumps. The rig was contracted for on a straight day-work basis.

Conductor Casing Cemented

Following spudding in, 20-in. o.d. conductor casing was cemented at 100 ft. and 13⅜-in. o.d. surface casing was cemented at 1,509 ft., in a total of 18 days. To this depth, the Tropic, Dakota, Morrison, Summerville, and Entrada formations were penetrated.

Prior to commencement of drilling, a drilling-mud program was selected consisting primarily of a sodium bentonite type mud, with sodium tetraphosphate and sodium bicarbonate treatment to be used for anticipated anhydrite and gypsum contamination. Also, bulky and fibrous materials were to be used in combatting lost circulation. In general, this mud program was followed throughout the drilling of the well.

Drilling proceeded below the 13⅜-in. o.d. casing without difficulty except for minor loss of returns that were regained by using fibrous and bulky material.

At 3,939 ft. returns were lost and the drill pipe stuck. Driving from the

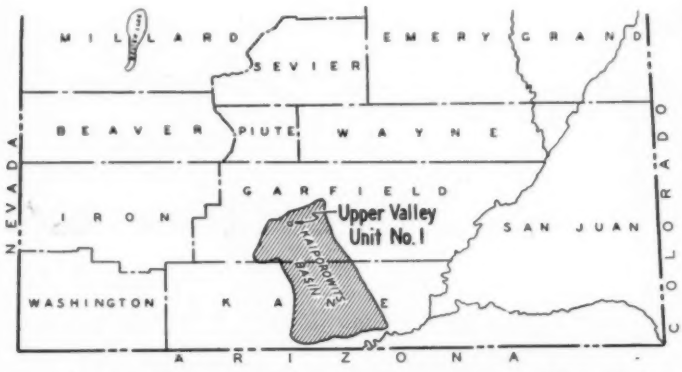

Fig. 1—Location of The California Co.'s southern Utah producer, in the Kaiporowits basin

*Division engineer, production department, The California Co., Denver, Colo. Paper presented at A.P.I. Rocky Mountain production meeting, Casper, Wyo.

These *INDIVIDUAL* "Rolling Dogs"

. . . roll up and let go the instant pipe is raised! No sticking!

MISSION Regular Rotary Slips with flexible handles. Rigid handles optional.

Record speed, running in and coming out . . . extra support of the pipe with "cushioning" grip . . . safety of workmen because slips do not stick in the rotary . . . these are the outstanding advantages of MISSION "Rolling Dog" Slips.

MISSION Slips are the only slips that grip and release instantly and positively. Today these famous slips lead throughout the world in sales and popularity.

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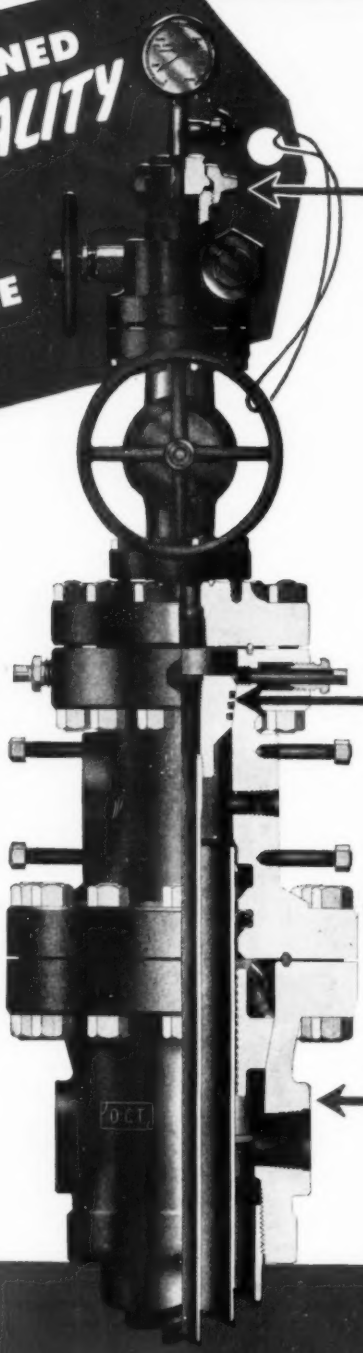
C-18-E SLIPS—Hinged for fast installation. May be dropped through preventers before cementing.



JE-1 FLOW CONTROL . . . four pieces in one—quick change wing valve.

T-16 THREADED HANGER (other interchangeable models available).

T-16 OU TUBING HEAD. Positive dual casing seal, no installation labor, reduced pressure area, low flange stress.

C-18-E SLIPS
Other interchangeable C-18 hangers available

C-18 CASING HEAD BODY.

For areas where pressure around the casing at time of setting is not a problem and oil strings are less than 8000 feet, this quality O-C-T Wellhead Assembly offers a low cost, efficient unit, quickly installed without numerous loose parts.

The C-18-E Slips are conveniently hinged for handling and have maximum load capacity consistent with their length. They can be dropped through preventers to provide casing support before removing preventers, if desired.

The O-C-T OU Seal is positive and automatic. Simply cut casing off at right length, bevel edge and install tubing head.

Write today for complete engineering details on this high quality low pressure wellhead assembly.

NOTE: FOR DEEP WELLS WITH HEAVY STRINGS AND HIGH PRESSURES AND WHERE A SEAL IS NEEDED BETWEEN STRINGS PRIOR TO REMOVING BLOWOUT PREVENTERS, OUR C-19 CASING HEAD IS RECOMMENDED.

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Oil Center Tool Co.

P. O. Box 2091, Houston, Texas

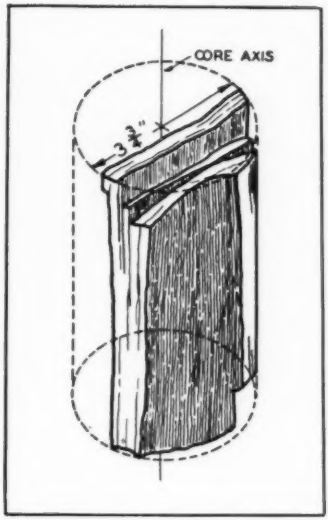


Fig. 3—Sketch of core section from the Kaibab formation, showing perpendicular fractures

surface and alternately spotting diesel oil, water, and crude oil failed to free it. The drill pipe was subsequently recovered by washing over, together with the use of electrical freeze-point determination and drill-pipe "backing-off" equipment.

To 6,042 ft., reached in the total time of 86 days, the Carmel, Navajo, Todilto, Wingate, Chinle, Shinarump, and Moenkopi formations were penetrated. A show, in tight sand in the Moenkopi formation, from 5,890 to 5,915 ft., detected by logging and a cuttings-analyses unit, was cored and drill-stem tested, with no oil or gas recovered.

The Kaibab limestone, equivalent to the Embar and Park City formations found elsewhere in the Rocky Mountain region, was cored and drill-stem tested. A total of 260 ft. of oil-strained dolomite and sand, from 6,042 ft. to 6,302 ft., was cored with 12 drill-stem tests run selectively through the interval cored. The top 158 ft. had permeability too small to measure with small amounts of oil-cut mud recovered by drill-stem tests. The lower 102 ft. had fairly good permeability, but was water-flushed.

Cement Plug Spotted

To further evaluate this cored and tested interval before drilling deeper, a 35-sack cement plug was spotted above it and 9⅝-in. casing was cemented at 6,041 ft. After cementing the 9⅝-in. casing, the Kaibab formation previously cored and drill-stem tested was again tested. The hole below the 9⅝-in. casing was progressively plugged back with cement during the 24-day testing period in an attempt to exclude water. Faint traces of oil were obtained in large quantities of water, in addition to approximately 2 bbl. of 29°-A.P.I. gravity oil, recorded on displacing water in the casing with mud, preparatory to drilling ahead.

During this testing period, 43 days were consumed in recovering stuck drill pipe caused by caving of the open-hole section below the 9⅝-in. casing and sticking the drill pipe while spotting 50 sacks of cement on bottom during plug-back operations to shut off water. When the drill pipe stuck, approximately 15 sacks of cement had been displaced out the bottom of the open-ended drill pipe, and because circulation couldn't be established either by normal or reverse circulation, the drill pipe became cemented-up, as well as stuck. Alternate washing over and cutting off sections of the drill pipe with outside cutting tools successfully retrieved the fish.

Drilling continued after the extended Upper Kaibab formation testing and a show was cored from 6,430 to 6,438 ft. with 8 ft. of tight, oil-stained, water-flushed sand recovered. A dense, tight, fractured, oil-stained dolomite section was cored and drill-stem tested from 6,714 to 6,796 ft., recovering slight amounts of oil-cut mud. Some lost circulation was experienced while drilling in the lower section of the Kaibab formation.

A fairly permeable oil-stained sand in the Coconino formation, equivalent to the Tensleep and Weber formations in other Rocky Mountain areas, from 6,842 to 7,138 ft., was cored and drill-stem tested with slight amounts of oil-cut mud recovered in the upper 150 ft., with water having a strong hydrogen sulfide odor recovered in the lower part. Also, a slight show in tight oil-stained dolomite and sand at the base of the Coconino formation, from 7,873 to 7,997 ft., was cored and drill-stem tested but was found to be water-flushed.

Two fishing jobs took place while drilling the Coconino formation and, in both instances, the cause was attributed to caving hole. Washing-over operations during each of these two fishing jobs substantiated this cause, since it was necessary to drill out hard formation around the outside of the drill pipe. Fig. 3 shows a section of core from the Kaibab formation having perpendicular fractures, which undoubtedly was re-

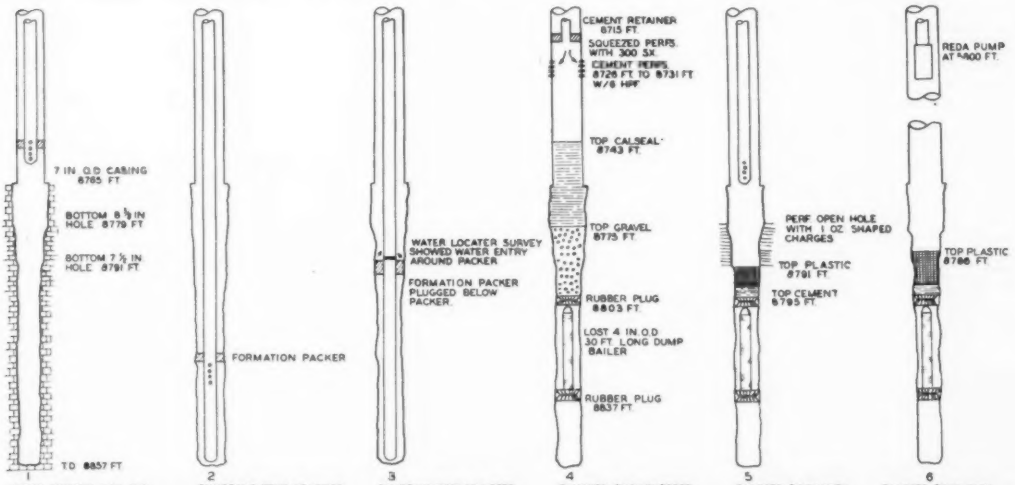

7 IN. O.D. CASING 6765 FT.
BOTTOM 8 ⅝ IN. HOLE 8779 FT.
BOTTOM 7 ⅞ IN. HOLE 8791 FT.
TD 8857 FT.
1
AFTER SETTING 7 IN. O.D. CASING SWABBING TEST OF ENTIRE EXPOSED ZONE RECOVERED WATER
FORMATION PACKER
2
SWABBING TEST OF LOWER 35 FT. OF EXPOSED ZONE RECOVERED WATER
WATER LOCATER SURVEY SHOWED WATER ENTRY AROUND PACKER
FORMATION PACKER PLUGGED BELOW PACKER.
3
SWABBING TEST OF UPPER 27 FT. OF EXPOSED ZONE RECOVERED WATER
CEMENT RETAINER 8715 FT.
SQUEEZED PERFS. WITH 300 SX.
CEMENT PERFS. 8726 FT. TO 8731 FT. W/8 HPF
TOP CALSEAL 8743 FT.
TOP GRAVEL 8775 FT.
RUBBER PLUG 8803 FT.
LOST 4 IN. O.D. 30 FT. LONG DUMP BAILER
RUBBER PLUG 8837 FT.
4
PLUGGED BACK EXPOSED ZONE AND SQUEEZED PERFS IN 7 ⅛ IN. O.D. CASING
PERF. OPEN HOLE WITH 1 OZ. SHAPED CHARGES
TOP PLASTIC 8791 FT.
TOP CEMENT 8795 FT.
5
PLUGGED BACK WITH PLASTIC AND TEST OF 28 FT. OF EXPOSED ZONE RECOVERED WATER
REDA PUMP AT 5800 FT.
TOP PLASTIC 8786 FT.
6
PLUGGED BACK WITH PLASTIC AND TEST OF 21 FT. OF EXPOSED ZONE RECOVERED 90 % OIL

Fig. 4—Sketches showing order and detail of completion procedures for well

sponsible for the stuck drill pipe and the difficult washing-over. Diamond rotary shoes, 8⅜-in. o.d. and 6⅝-in. i.d., greatly facilitated washing-over and recovering both drill pipe and twenty 30-ft. drill collars being used in drilling this section.

For comparison it required three conventional rotary shoes and 22½ hours to wash over 8 ft. of drill collars, whereas one diamond rotary shoe washed over 25 ft. of drill collars in the same time. One diamond rotary shoe washed over a total of 252 ft. of drill collars with continuous hard-formation cutting, in addition to cutting through the shank of a rock bit within 1 in. of the cones, and was still in usable condition.

Through the Rico-Supai and the upper part of the Hermosa formations, from 8,050 to 8,698 ft., 8⅜-in. o.d. diamond core heads, run on a 30-ft., 5⅛-in. o.d. conventional core barrel, were employed in an effort to increase the drilling speed. Satisfactory results were obtained. This size core head permitted a large-size hole—sufficiently large to accommodate 7-in. o.d. casing—to be maintained without the necessity and expense of reaming. A total of 410 ft. of hard dolomite, sand, and lime, was cored in this manner.

At 8,779 ft. returns were lost and could not be regained after pumping approximately 3,000 bbl. of mud containing large amounts of bulky and fibrous material into the formation. Two cores were then cut, from 8,779 ft. to 8,791 ft., without circulation, recovering 2¼ ft. of dense limestone having oil staining in horizontal and vertical fractures. The cored interval was then drill-stem tested employing a regular formation-type packer run on 2½-in. EUE tubing. Tubing was used in lieu of drill pipe to permit swabbing and to facilitate fishing operations in the event the tubing could not be pulled on completion of the test. Approximately 175 bbl. per day of very viscous, black 14° A.P.I. gravity oil was swabbed during the 5-day test. Attempts to unseat the packer or back off the safety joint above the packer failed, and the next 11 days were spent in washing over, cutting, and retrieving the tubing. A 1¼-in. o.d. bridging ball was dropped in the tubing to seat in the test tool for sealing off the thief limestone below the packer, permitting circulation to be established during the fishing operations.

The 12 ft. of fractured oil-stained limestone was then covered with pea gravel and calseal, and 7-in. casing was cemented at 8,765 ft. The collars on the bottom 1,038 ft. of the 7-in. casing were machined down ¼ in. to insure passage through the 8⅜-in. diamond cored section of the hole. Thereafter, coring was continued below the 7-in. casing to 8,857 ft., recovering more of the dense limestone having oil-stained fractures.

Approximately 10,000 bbl. of water were lost to the formation without returns, while coring the additional 66 ft. With 78 ft. of fractured limestone exposed below the casing, a swabbing test of this interval recovered large amounts of water with about 5 per cent 14° A.P.I. gravity oil. In an attempt to ascertain the water source, a second swabbing test of the lower 35 ft. of exposed formation recovered water with a trace of oil. In a further attempt to ascertain the water source, a swabbing test of the upper 27 ft. of exposed formation recovered water with about 3 per cent oil.

During this test a water - locator survey run in the tubing - casing annulus indicated the water to be entering the hole at the top of the packer, blanking off the lower 65 ft. of formation, and not around the casing shoe. Also, it was ascertained that no leaks were in the 7-

(Con. on page 109)

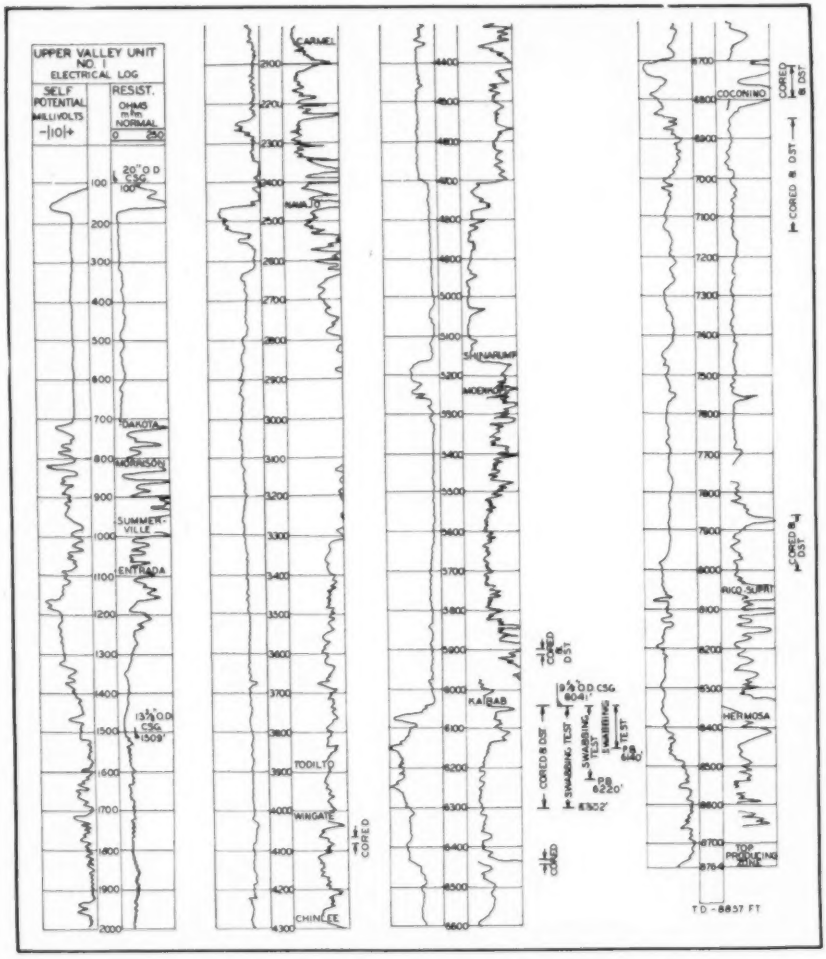
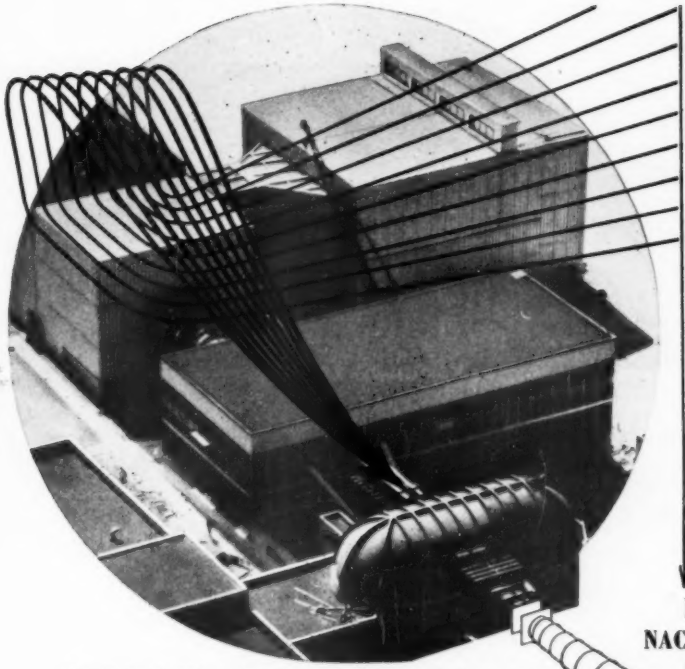


Fig. 5—Electric log of California Co.'s new southern Utah oil producer



The National Advisory Committee for Aeronautics' giant supersonic wind tunnel. Photo, taken before the enclosure was completed, shows the huge conical diffuser through which air is discharged.

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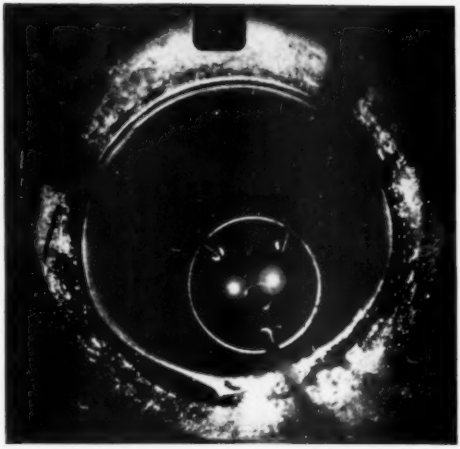
Casing Checks obtained with Deep-Tube Camera

by Robert Harwick
District Editor

Here is a description of a new camera that photographs inside well bores. Depth sequence pictures for two wells in the Wilmington, Calif., area are presented.



Above: Photo of collar failure at a casing joint. The underneath joint can be seen pressing in from the bottom of the upper pipe joint

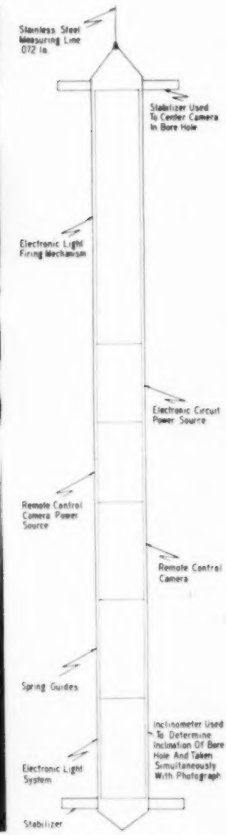
DEVELOPMENT of a camera that will take photographs of casing in the well brings a new and unique tool to aid in the study of field production problems. The camera carries its own light and light source. It takes photographs automatically under exceedingly difficult photographic conditions.

The camera will take pictures in dry wells, under gaseous conditions, and under water. An attempt will be made in the near future to take pictures of casing in a well filled with mud and oil. The plan here is to displace temporarily the mud and oil with a slug of water at the time of film exposure.

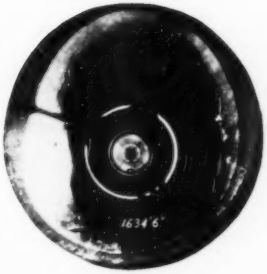
The operating limits are claimed to be 4,500 psi. pressure and better than 200° F. This would permit taking pictures at 8,000 ft. in a well filled with water. Problems of condensation and lens fogging have been solved as well as the problem of adequate and safe illumination.

The camera was developed by William E. Crane and Russell Journigan*. In its original form it was used to take under-water pictures for salvage and damage records. Long Beach Development Co., concerned with a subsidence and formation slipping problem in the Terminal Island area of Wilmington field,

*President and design engineer, Deep Tube Photo Survey Co., Long Beach, Calif.


Stainless Steel Measuring Line .072 In.
Stabilizer Used To Center Camera In Bore Hole
Electronic Light Firing Mechanism
Electronic Circuit Power Source
Remote Control Camera Power Source
Remote Control Camera
Spring Guides
Inclinometer Used To Determine Inclination Of Bore Hole And Taken Simultaneously With Photograph
Electronic Light System
Stabilizer

William E. Crane with the deep-tube camera. This is the camera as used in the survey of well W-60, Long Beach Development Co., Wilmington field, Terminal Island area, California. Extreme right: Details of camera construction



Above and left: Seven pictures taken at 3-in. intervals showing the casing as the camera moves down the well. The pictures clearly show normal casing, area of damage, and the passage to a lower area of normal casing. They also show the record of the plumb-bob position in the inclinometer cylinder

California, encouraged Crane to adapt the camera for in-well photography.

The first camera was assembled and tested in well No. 77 of Long Beach Development Co. The photographs obtained clearly showed casing failure through the forcing in of the casing wall at the depth of 1,633 ft.

Since this first run the camera has undergone various refinements. At the present time it looks as shown in an accompanying illustration. The entire apparatus is 6 ft. long. The tube that makes up the larger part of the apparatus contains condensers and dry-cell batteries. The lower part of this tube holds the film and camera mechanism. The lens can be seen projecting from the bottom of the tube.

A short distance below the tube is a metal cylinder. This contains a plumb bob suspended on cross hairs over an inclinometer scale. Below the inclinometer cylinder is the light tube, contained in the turnip-shaped case making up the lower end of the apparatus. The curved metal pieces on the side of the apparatus are stabilizing and centering springs.

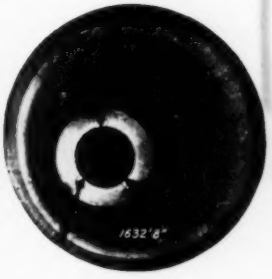
The light is an electronic repetitive flash, condenser discharge type, similar to an Edgerton tube. High voltages are required to activate the tube. Voltages are in the nature of 2,000 volts for the electrode gas used in this tube.

As the light flashes two 360° by 3-in.-high bands of light illuminate the casing wall. One band is direct light and hits the casing opposite the light tube. The second band is indirect light. It hits the casing just above the direct light band and fades up the casing wall. Thus the photographs show two distinct bands of light. The 3-in. height holds for 8⅝-in. casing only but is adjustable to give similar bands in other size casing.

The position of the plumb bob is also recorded by the camera. The bob

(Continued on page 109)

Right: Four photographs taken in well W-77. In the first picture (1,632 ft. 8-in.) the normal casing is shown; 8 in. below there is a definite bulge in the casing; 5 in. farther down the full damage is shown; 8 in. beyond, the camera has passed the area of damage and the light bands are beginning to assume the normal circular form. The shadows on the left are caused by casing bulges between the light and the camera. These are the first pictures taken in seven wells. They show an example of compression fatigue



CONTINUOUS CONTACT COKING Process

by A. H. Schutte* and W. C. Offutt†

IN general, during the past 10 to 20 years, refiners have coked their heavy residual stocks to produce more valuable light oils when minimum fuel oil and maximum gasoline were desired. These coking operations were carried out in fired batch coke stills or with tubular oil heaters discharging into coking drums which were operated on a noncontinuous or time-cycling basis. These processes have high labor requirements and require expensive coke-removal equipment.

During the war, and shortly after, residual fuels were in demand, thereby reducing the desirability of coking. However, this situation has changed recently, owing to the requirement of maximum distillate oils for catalytic cracking charge and the shortage of light distillate oil required to cut the virgin residuum to fuel-oil viscosity specifications. In addition, there is a reduced market for the final blended residual fuels, and the sales price has dropped considerably.

*The Lummus Co., New York. †Gulf Research & Development Co., Pittsburgh.

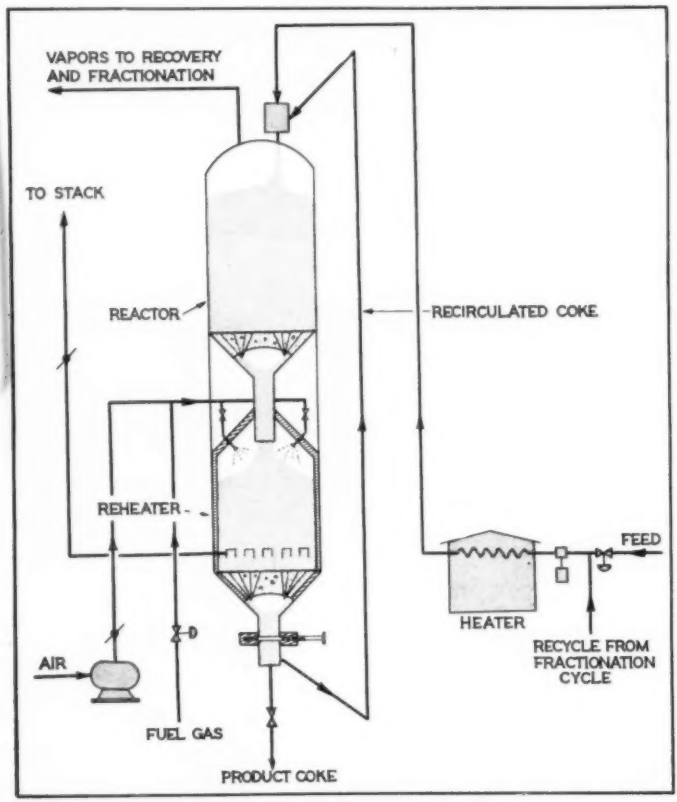


Fig. 1—Flow arrangement of new continuous and simplified coking process, recently developed for conversion of heavy residium oils into coke and light hydrocarbon products

The conversion to coke and light oils of the heavy residual bottoms fractions of the crude, after all gasoline, kerosine, furnace oil, and catalytic charging stock have been removed, results in additional catalytic charging stock, more gasoline, and releases to light heating oils the catalytic cutter oils otherwise used to blend off the flux tar bottoms to fuel specifications. Since the demand has increased for light oils to be used as heating and diesel fuels, any process which reduces the supply of residual fuel and increases the supply of light oils is very attractive from an economic standpoint.

Flow Arrangements

Flow arrangement of a new continuous and simplified coking process recently developed for the conversion of these heavy-residuum oils and tars into coke and valuable light-hydrocarbon products is shown in Fig. 1. This process, known as "continuous contact coking" operates on a heavy-hydrocarbon residuum charge preheated to a temperature of 750°-850° F. in a conventional tubular preheater. The preheated oil charge is then contacted on a relatively large quantity of hot circulating coke which has been produced in the process and is in the form of rounded lumps of $^1/_4$ to $^3/_4$-in. size. The temperature of the wetted coke after application of charge oil may be varied from 850° to over 1,000° F. by changing the preheat or the circulation rate of the coke.

The preheated residual hydrocarbon oils are distributed uniformly on the circulation coke. Since the oil is practically nonviscous at these elevated temperatures, it distributes itself and is taken up by the coke particles as a thin liquid microfilm with no adhesion or agglomeration of the circulating solids occurring. No trouble arises from plugging or flow stoppage during the time the high-temperature, nonviscous residual oil is being coked to a solid.

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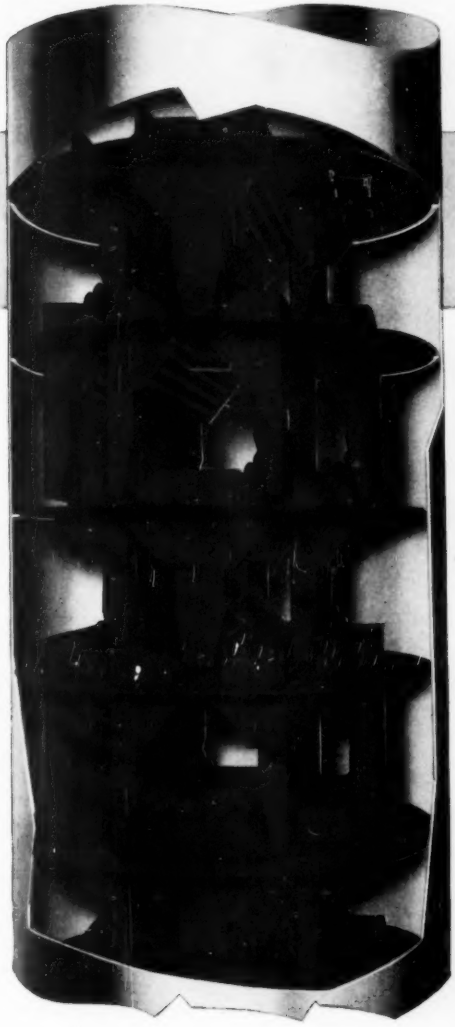

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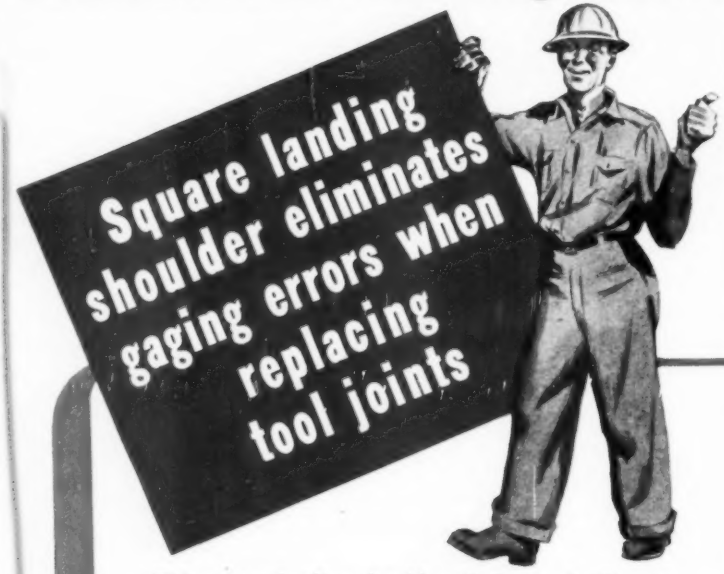

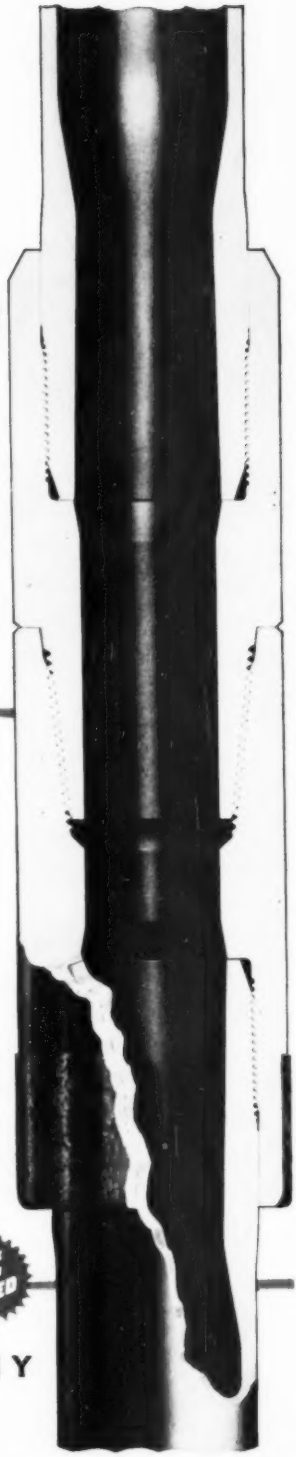

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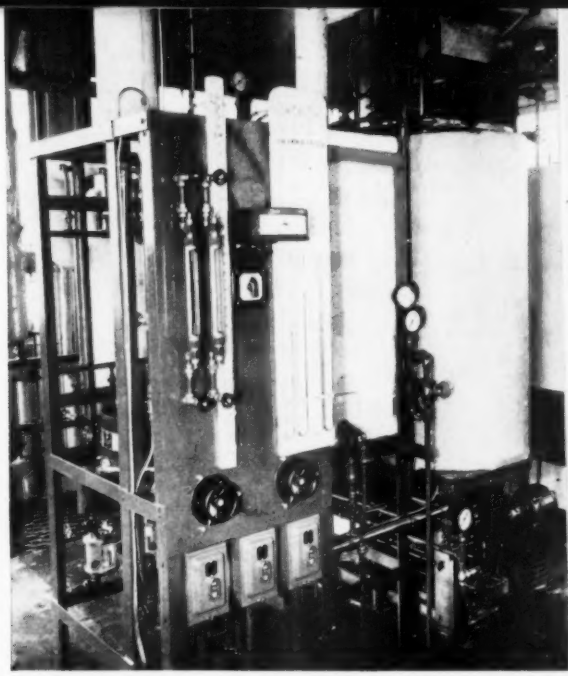

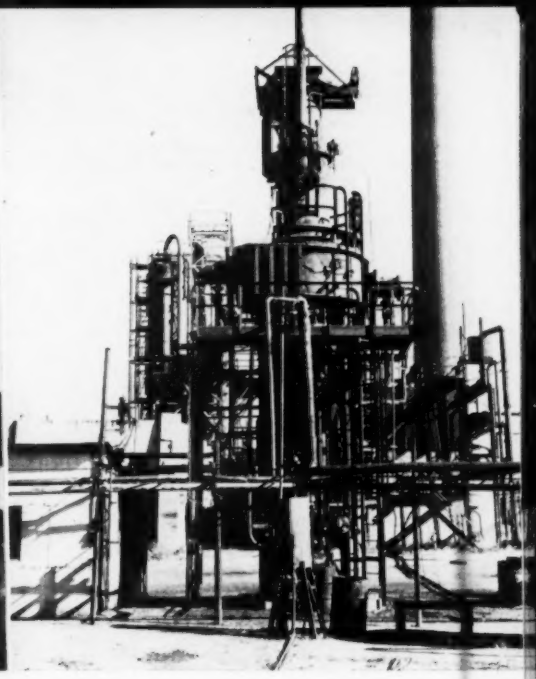

Fig. 2—(Left) Photo of control section of 2-gal.-per-hour continuous pilot unit, which made the laboratory runs on the new contact coking process. (Right) Fig. 3—Semicommercial-scale continuous contact coking pilot unit

the coke is carried on gradually in a cylindrical reactor vessel through which the wetted coke flows uniformly by gravity as a bed of free particles. The reactor volume is sufficient to give a solids residence time of 15 to 40 minutes, which is more than adequate to complete the conversion of liquid hydrocarbon to product vapors and dry coke.

The coke stream from the bottom of the reactor, carrying the increment coating produced from the aforementioned coking step, passes through a sealing zone into a reheater where it is heated by radiation and convection to the proper temperature for recirculation to the oil-feed contact point. The circulation of the reheated coke may be carried out by conventional mechanical elevators, such as have been used successfully in catalytic cracking plants, or by means of a vapor lift system.

Vapors from the reactor are normally removed at the top, adjacent to the coke inlet, and are quenched in the usual manner with a heavier recycle stream. The oil vapor contains a mixture of cracked components which are produced from coking the heavier fractions of the charge and heavy virgin oil vapors which have been distilled under conditions of low pressure and high temperature at the oil charge contact zone. The products from this method of coking have been subjected to a minimum of cracking and degradation and are suitable for subsequent catalytic or thermal cracking.

As the coking operation proceeds,

TABLE I—PILOT-PLANT CONTACT COKING OF VARIOUS REDUCED CRUDES

Reduced crude charge—	42° West Texas		15° West Texas	Illinois		Santa Maria	Eastern Venezuela
Pilot plant—	Laboratory		Semi-commercial	Semi-commercial	Laboratory	Laboratory	Laboratory
Type of operation—	Single pass						
Product yields, per cent of reduced crude charge:							
Gas (C_4 and lighter), wt. per cent	3.1	4.0	*13.0	*8.1	2.9	7.1	5.3
Gasoline, vol. per cent	4.8	4.9	15.7	12.1	13.7	8.0	7.6
Gas oil, vol. per cent	83.1	84.8	70.9	80.3	83.8	65.0	81.6
Coke, wt. per cent	6.8	6.5	5.1	3.1	8.1	15.4	13.6
Loss, wt. per cent	2.7	0.0	1.1	0.4		1.2	0.0
Reduced crude inspections:							
Gravity, °A.P.I.		18.2	10.7		18.4	5.8	13.4
Viscosity, S.U.S. at 210° F.		97.4			169		
Vol. per cent overhead at 900° F.		53	15		33	23	25
Carbon residue, per cent		6.4	11.5		8.0	14.2	13.8
Characterization factor		11.7	11.25		11.8	11.4	
Gas-oil inspections:							
Gravity, °A.P.I.	23.2	23.5	†17.5	†22.9	25.8	17.0	20.9
Viscosity, S.U.S. at 210° F.	41.7	40.6		46.0			56.2
Characterization factor	11.6	11.6	11.31	11.8	11.75	11.2	
Vacuum distillation, °F. at 760 mm.:							
10 per cent	550	528	600	634	530	405	606
50 per cent	752	745	807	841	760	755	815
90 per cent	977	977	939	974	935	955	984
End point	1,003	1,003			1,000	965	

*Yields from the semicommercial pilot plant are not representative of optimum operating conditions due to limited reactor volume.
†Inspections are of rerun gas oils with yields of 43.4 and 57.5 volume per cent of charge from West Texas and Illinois reduced crudes, respectively.

and successive increments of coke are deposited on the circulating particles, there is an increase of coke inventory in the system and a general increase in particle size. The net production is then drawn off as a free-running stream of dry lump coke of about ¾-in. diameter.

Since the coke is deposited in the form of many thin layers (.001-in.), and since it is reheated after each passage through the reactor, the product coke has a very dense structure instead of the foamy texture which is characteristic of the ordinary petroleum coke. The higher coking temperature and lack of large pores give a low volatile content and high mechanical strength to the coke.

Continuous contact coking produces less gas, less gasoline, more gas oil of superior quality, and less coke than do conventional coking methods operating on the same charge stock. Heavier stocks such as asphalts, pitches, and reduced tars may be processed, whereas the conventional methods, such as delayed coking, are limited to lighter materials which can be heated to a temperature of 900°-930° F. in fired heaters.

The investment cost of a continuous contact coker is about 60 to 80 per cent of that for the most modern conventional methods, and a significant cost saving is obtained by the elimination of the coke-removal equipment and crew.

TABLE 2—ONCE-THROUGH CONTACT COKING OF 30 PER CENT EASTERN VENEZUELA REDUCED CRUDE

Run number—	53	54	55A	55B
Solid medium—	7 A.I. clay		Coke	
Operating conditions:				
Oil inlet temperature, °F.	881	852	848	847
Oil vapor outlet temperature, °F.	898	873	862	832
Solids inlet temperature, °F.	953	955	902	857
Average reactor temperature, °F.	845	838	855	840
Reactor pressure, psig.	7.0	5.1	5.0	5.0
Solids residence time, minutes	30	29	20	20
Yields, volume per cent of charge:				
Debutanized gasoline	9.1	9.4	5.3	5.9
Butane-butene	1.6	1.6	2.3	2.3
Propane-propylene	1.9	1.9	2.9	2.8
Furnace oil	6.8	6.3	5.9	3.5
Heavy gas oil	71.0	72.5	75.7	72.3
Gas (C_3 and lighter), weight per cent	1.7	1.6	2.4	2.5
Coke, weight per cent	15.6	14.7	13.6	18.8
Charge stock:				
Gravity, °A.P.I.	13.2	13.2	13.2	13.2
Carbon residue, per cent	10.9	10.9	10.9	10.9
Sulfur, per cent	1.67	1.67	1.67	1.67
Vacuum distillation, °F. at 760 mm.:				
Overpoint	502			
10 per cent	760			
20 per cent	825			
30 per cent	878			
40 per cent	950			
Properties of rerun products:				
Gasoline:				
Gravity, °A.P.I.	51.0	49.6	53.3	54.9
Reid vapor pressure, psi.	1.4	1.0	1.0	3.0
Oxygen stability, minutes	456	14		
Preformed gum, mg./100 cc.	18	168	57	
Bromine number	91	75	84	
Aniline point, °F.	93	94	128	128
Sulfur, per cent	0.6	1.4	0.6	0.6
A.S.T.M. distillation, °F.:				
I.b.p.	176	164	160	143
10 per cent	228	218	219	201
50 per cent	300	300	299	280
90 per cent	375	374	360	365
End point	409	403	398	392
Motor octane number, clear	67.6	63.9	60.2	60.4
Motor octane number, +3 cc. TEL	74.1			
Research octane number, clear		71.2		
Furnace oil:				
Gravity, °A.P.I.	32.9	32.4	33.4	35.3
Aniline point, °F.	113	120	128	131
Sulfur, per cent	1.2	1.3	1.3	1.2
A.S.T.M. distillation, °F.:				
I.b.p.	416	440	448	428
10 per cent	445	465	470	450
50 per cent	483	506	501	482
90 per cent	559	580	569	554
End point	609	620	629	602
Total gas oil:				
Gravity, °A.P.I.	21.8	21.8	20.9	22.2
Acid heat, °F. (A.S.T.M.)	35	41	21	30
Aniline point, °F.	170	178	173	175
Bromine number	19	21	13	17
Pour point, °F.	95	95	105	105
Sulfur, per cent	1.3	1.3	1.2	1.4
Carbon residue, per cent	0.9	*1.3	1.9	0.9
Viscosity, S.U.S. at 130° F.	95.5	142	189	146
Viscosity, S.U.S. at 210° F.		50.5	56.2	51.0
Vacuum distillation, °F. at 760 mm.:				
I.b.p.	399	440	391	409
10 per cent	537	578	606	572
50 per cent	763	828	815	805
70 per cent	815	872	886	862
90 per cent	885	934	984	942

*90 per cent overhead on Run 54 total gas oil was 22.8° A.P.I., 0.03 carbon residue. See Table 3.

Development of the Process

Development work on the continuous contact coking process began more than 5 years ago with the construction of an isothermal fixed-bed laboratory bench-scale unit. This unit was constructed to establish the range of process conditions required for the coking without binding together the solids with the coke product and to evaluate such basic variables as oil to solids ratio, solids residence time, and solids temperatures and their effect on yields of light-hydrocarbon products and coke.

Operations on the fixed-bed unit demonstrated that the injected heavy oils would wet all of the particles approximately equal and that coking could be accomplished even in a static bed without cementing of the inert solids

Charge stocks ranging from 4.8° A.P.I., 117° F. melting point Santa Maria bottoms to a light 18° A.P.I. East Texas fuel oil were coked to obtain data for the design of a large-scale continuous laboratory pilot plant. Fig. 2 is a photograph of the control section of a 2-gal.-per-hour continuous pilot unit which was constructed in the spring of 1944 and successfully operated on a variety of charge stocks and inert solids, including beach gravel, coke, and spent T.C.C. catalyst. The operations using solids other than coke were made by continuously burning the deposited carbon from the circulating solids.

In the coking-on-coke runs the reheating of the circulating coke was done by continuous partial combustion. Only the necessary quantity of coke was burned to reheat the circulating coke mass to the desired contact temperature. Coking-on-coke runs were also made by continuous nonoxidizing reheating using radiation and convection. Most of the latter runs were made for coke production, since the fuel balance in most refineries is such that an operation for coking-on-coke with the production of coke as a product looked more generally attractive than an operation using inert refractory solids with generation of steam from the heat of combustion of the residual coke.

Extended runs were also made to determine the characteristics of the equilibrium coke after 65 passes through the coking reactor. The early pilot-unit data were checked and extended by independent pilot-plant work in the Gulf laboratories.

The combined laboratory-scale pilot-plant work described above had defined the solids-to-oil ratios, solids

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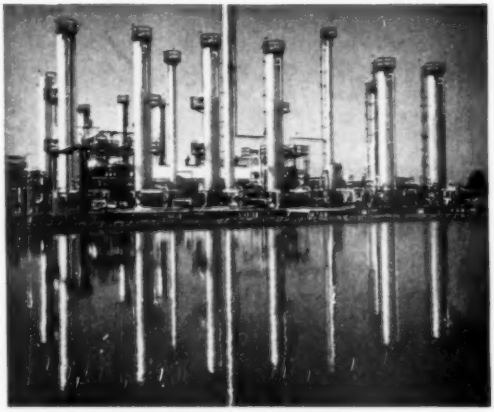

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residence time, temperature, and yield-distribution characteristics of the contact coking process. It had also shown the feasibility of using coke as a circulating material and producing coke continuously as a product.

Since most of the current interest in the process was for the production of catalytic charge stock having as near virgin characteristics as possible, large samples of the gas oil product were needed for evaluation of its catalytic cracking characteristics. For this purpose an existing pilot unit was converted to a 50-bbl.-per-day continuous coking pilot unit.

The operation of this semicommercial pilot unit (Fig. 3) in the summer of 1947, in addition to producing large samples of products, was valuable as a means for evaluating alternative methods for charge oil application, coke reheating, and coke flow-controlling devices. There were inherent limitations (inadequate bed depth) in the converted equipment, which necessitated operations being made at temperatures higher than desirable, but the yields and product distribution bore out the results obtained on the smaller pilot plants. Complete evaluations, including catalytic cracking of the products, were obtained in extensive pilot-plant investigations on the synthetic crudes produced in the 50-bbl.-per-day pilot unit.

Product Quality and Yields

The data from several representative contact coking runs are given in Table 1, together with the characteristics of the gas oils produced. These coker gas oils are of near virgin character, as reflected by the characterization factors; they show only a very slight decrease from the characterization factors of the virgin charge stocks. The lighter products show increasing degrees of unsaturation as the molecular weights decrease. Thus, the gases are highly unsaturated, and the gasolines usually run 8 to 10 octane numbers higher than those from conventional coking and have 8 to 14 points spread between research and motor octane numbers, depending upon the reactor temperature employed.

The results obtained by once-through contact coking of a 30 per cent Eastern Venezuela reduced crude on inactive clay and coke are given in Table 2. A high yield of gas oil was obtained of near virgin character and boiling range suitable for catalytic cracking charge. Correlations of data obtained over a wide range of operating conditions show that the conversion per pass to 900° F. end point gas oil increases as the average reactor temperature is decreased, provided the reactor volume is sufficient to permit complete coking of the unvaporized oil. The production of dry gas at a given conversion increases rapidly with reactor temperature. The yield of gasoline and the gasoline octane number increase with an increase in vapor outlet temperature and are nearly independent of the type of solids used.

Data from once-through Thermofor catalytic cracking of contact coker gas oil from Eastern Venezuela reduced crude are shown in Table 3. The yield of catalytic cracking charge was 71 per cent of the original charge to the once-through contact coker, and the over-all yields from the combined coking and cracking are shown in Table 4. It will be noted that this processing produced 30 volume per cent of debutanized 74 motor octane gasoline and a propane-free liquid recovery of 87 volume per cent.

Catalytic cracking data obtained by cracking (fluid process) of the rerun gas oil from the 50-bbl.-per-day contact coker runs on Illinois reduced crude are given in Table 5. This gas oil produced higher gasoline octane numbers and somewhat higher yields of coke and gas at the same conversion than did a virgin gas oil from the same crude. Allowance in evaluating the data should be made because this coker gas oil was produced under unusually severe conditions imposed by the limited reactor volume in the 50-bbl.-per-day unit. Unusually high carbon residues were obtained in rerunning this coker synthetic crude after storage for several months. The carbon yield on catalytic cracking is therefore higher than would be expected on a combined commercial operation.

The contact coking process produces a coke of ½-in. to over ¾-in. particle size, having 1.5 to 5.0 per cent volatile matter, 0.5 per cent ash, and a bulk density of 58 to 60 lb. per cu. ft. The sulfur content will depend on that of the reduced crude charge. The coke is relatively low in porosity and very high in mechanical strength, individual particles having a crushing strength of 600 psi.

The burning characteristics of the coke as a fuel have been tested and found to be at least equal to anthracite coal, with the added advantage of low ash content. It is a premium fuel for either domestic or industrial use. For electrode manufacture the low volatile and moisture contents are advantages. Calcining to 0.5 per cent volatile content can be done cheaply and with low loss by providing a calciner on the coking unit and by charging the hot product coke stream to utilize the waste heat in the process.

Commercial Plant Design

Complete designs and estimates have been made for contact coking units of 6,500 to 10,000-bbl.-per-day reduced crude charging capacity. In a typical commercial unit the reduced crude charge is preheated in a conventional fired heater to 850° F. and is then thoroughly contacted with the circulating stream of preheated coke particles. The oil-laden coke particles are then introduced into the top of the reactor and flow

TABLE 3
Single-Pass Thermofor Catalytic Cracking of Contact Coker Gas Oil From Eastern Venezuela Reduced Crude

Cracking conditions:	
Catalyst	31 Activity natural
Average reactor temperature, °F.	943
Space velocity, V/hr./V	1.59
Catalyst-to-oil ratio, tons/hr./1,000 bbl. oil/day	11.3
Coke burnoff, lb./hr./1,000 bbl. oil/day	520
Type of operation	Concurrent-adiabatic
Product yields, vol. per cent of gas-oil charge:	
Debutanized gasoline	29.1
Butane-butene	6.7
Propane-propylene	5.6
Furnace oil	27.2
Heavy gas oil	33.1
C_2 and lighter (wt. per cent)	3.8
Coke (wt. per cent)	3.9
Cracking-stock inspections:	
Gravity, °A.P.I.	22.8
Bromine number	21
Aniline point, °F.	167
Carbon residue, per cent	0.03
Characterization factor	11.7
Vacuum distillation, °F. at 760 mm.:	
10 per cent	579
50 per cent	825
90 per cent	950
Product inspections:	
Gasoline:	
Gravity, °A.P.I.	53.8
Reid vapor pressure, psi.	5.4
Aniline point, °F.	63
Bromine number	88
Preformed gum, mg./100 cc.	144
Copper dish gum, mg./100 cc.	462
Oxygen stability, minutes	74
Sulfur, per cent	0.35
A.S.T.M. distillation, °F.:	
I.b.p.	110
10 per cent	140
50 per cent	266
90 per cent	383
End point	420
Motor octane number:	
Clear	78.6
+3 cc. TEL	82.7
Research octane number:	
Clear	90.0
+3 cc. TEL	95.0
Total gas oil:	
Gravity, °A.P.I.	20.1
Aniline point, °F.	127
Bromine number	14
Viscosity, S.U.S. at 100° F.	46
Carbon residue, per cent	0.91
Sulfur, per cent	1.15
Vacuum distillation, °F. at 760 mm.:	
10 per cent	477
50 per cent	640
90 per cent	795

TABLE 4
Contact Coking and Thermofor Catalytic Cracking of Eastern Venezuela Reduced Crude*

Yields, vol. per cent on charge to coking unit:	
Debutanized motor gasoline	30.0
Butane-butene	6.4
Propane-propylene	5.9
Furnace oil	19.3
Heavy gas oil	31.3
Gas (C_2 and lighter), wt. per cent	4.1
Coke, wt. per cent	†17.3
Octane number of combined gasoline, C_4 free motor, clear	74.0

*Combined yields from once-through continuous contact coking and Thermofor catalytic cracking of the 30 per cent reduced eastern Venezuela crude. †Carbon residue of reduced crude—13.5 per cent.

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through the reactor as a moving bed. The residence time for the solids in the reactor is 30 to 40 minutes, during which time the hydrocarbon liquid is converted into vapor and dry coke. The coke is deposited as a very thin layer on the original coke particles.

At the bottom of the reactor the coke flows through a specially designed solids draw-off device which maintains uniform flow in the reactor and passes through a vertical seal leg into the top of a coke reheater. In the coke reheater, radiant combustion burners supply heat to the circulating coke, and convection heat is also obtained from the resulting flue gases.

From the bottom of the reheater the coke flows by gravity through control valves to elevator charge inlets. Constant inventory is maintained as coke is produced by continuously drawing off a net coke product stream of the largest particles. The average particle size of the circulating coke is maintained by passing a portion of the circulation through adjustable sizing rolls.

The coke elevators are standard pressure-type round-case units of the same type which have given very satisfactory service in T.C.C. plants. The operating conditions in coking service are milder than in catalytic cracking, since no abrasive dust is present, and the solids temperatures

TABLE 5

Single-Pass Fluid Catalytic Cracking of Contact Coker Gas Oil From Illinois Reduced Crude

Run conditions:	
Catalyst	28 Activity synthetic
Average reactor temperature, °F.	926
Space velocity, W./hr./W (total feed basis)	3.33
Catalyst-to-oil ratio, W/W (total feed basis)	9.0
Slurry oil recycle, vol. per cent of fresh feed	10
Estimated commercial carbon burnoff, lb./hr./1,000 bbl. of fresh feed/day	768
Yields, vol. per cent of gas-oil charge:	
10 R.v.p. gasoline	46.5
Excess butane-butene	5.3
Propane-propylene	6.2
Furnace oil	19.9
Heavy cycle stock	21.1
Slurry oil	5.0
C_2 and lighter (wt. per cent)	2.5
Coke (wt. per cent)	5.8
Cracking-stock inspections:	
Gravity, °A.P.I.	22.7
Bromine number	18
Aniline point, °F.	180
Vacuum distillation 95 per cent point at 760 mm.	989
Characterization factor	11.78
Carbon residue, per cent	*0.73
Inspections of rerun products:	
Gasoline:†	
Gravity, °A.P.I.	58.7
Reid vapor pressure, psi.	10.5
Bromine number	118
Aniline point, °F.	64
Preformed gum, mg./100 cc.	14
Copper dish gum, mg./100 cc.	347
Oxygen stability, minutes	468
Sulfur, per cent	0.13
A.S.T.M. distillation, °F.:	
I.b.p.	96
10 per cent	119
50 per cent	223
90 per cent	375
End point	406
Octane numbers (corrected to 10 R.v.p.):	
Motor, clear	79.4
Motor, +3 cc. TEL	82.9
Research, clear	94.3
Research, +3 cc. TEL	97.7
Furnace oil:	
Gravity, °A.P.I.	22.3
Aniline point, °F.	72
Sulfur, per cent	0.83
A.S.T.M. distillation, °F.:	
I.b.p.	414
10 per cent	496
50 per cent	529
90 per cent	589
End point	629
Heavy cycle stock:	
Gravity, °A.P.I.	18.6
Aniline point, °F.	151
Sulfur, per cent	0.72
Viscosity, S.U.S. at 130° F.	59
Vacuum distillation, °F. at 760 mm.:	
10 per cent	668
50 per cent	728
90 per cent	788

*Coker synthetic crude stored for several months before rerunning. On commercial tower, carbon residue would be 0.2 per cent maximum (see Table 3), thus catalytic cracking coke yields are higher than representative. †Inhibited with 10 lb. U.O.P. No. 5 per 1,000 bbl.

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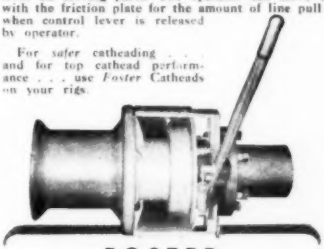

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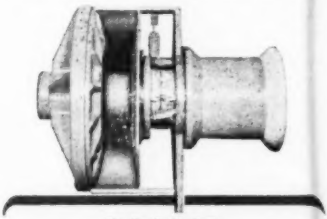

FOSTER BREAKOUT CATHEAD

Safer . . . slower line speeds prevent jerking of tongs. *Faster* . . . powerful friction clutch engages or disengages either instantly or gradually at the will of the operator without slowing cathead shaft. *Dependable* . . . heavy bearings, ample lubrication, powerful single plate friction clutch, heat-resistant clutch facings, high quality materials combine to make a durable cathead. *Economical* . . . designed for direct shaft mounting to reduce bending of cathead shaft; stationary sleeve mounting for drum (patented) common to both catheads, eliminates complicated brake.

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are lower than those prevailing in cracking service.

The vapors from the coking reactor are quenched and fractionated in a conventional low-pressure tower to produce gas and gasoline overhead, 100° to 900° F. boiling-range gas oil, and bottoms. A 400° to 700° boiling-range gas oil may be produced, if desired. The bottoms are recycled to the coking reactor to obtain ultimate yields.

Comparison of Contact and Delayed Coking

A comparison of yields obtainable by contact and delayed coking of two different reduced crudes is given in Table 6 for operations aimed at maximum production of gas oil for catalytic cracking charge. The contact coker shows 9 to 11 per cent higher gas oil yields and lower gas, gasoline, and coke yields than the delayed coker, as would be expected from the lower heater temperature and minimum vapor cracking characteristics on contact coking operations of this type.

The comparative utility requirements given in Table 7 reflect the elimination of the high-pressure decoking water pump in the contact process and the labor savings due to the elimination of the decoking crew.

In various cases where construction-cost estimates have been prepared for contact coking and delayed coking, including complete fractionation equipment, the contact coker cost has amounted to a value of 60-80 per cent of that for delayed coking. This savings depends on the size of the unit, the use of alloys, and various other factors, and is in general greater for the medium-capacity units, since the cost of the hydraulic decoking equipment used with delayed coking remains essentially constant, regardless of plant capacity. When the coking section alone is considered, as in cases where coking facilities are to be added to an existing heater and tower system, the savings may be even greater.

Space requirements for the contact coker are less than for conventional coking plants. The delayed coker requires more space for its decoking water recovery and settling system than the entire plot space for the contact coking unit.

The continuous contact coker has an unusual degree of flexibility. It can charge any heavy residual stocks that may be available, whereas vac-

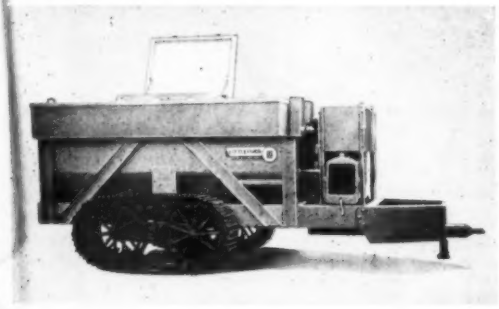
TABLE 6—COMPARISON OF CONTACT AND DELAYED COKING YIELDS RECYCLING TO ULTIMATE YIELDS

Operation—	Contact coking	Delayed coking	Contact coking	Delayed coking
Reduced crude charge	Mid-Continent		West Texas	
Reduced crude inspections:				
Per cent on crude	26.5	26.5		
Gravity, °A.P.I.	20.6	20.6	14.3	14.3
Carbon residue, per cent	8.2	8.2	11.5	11.5
Product yields, per cent on coker charge:				
Gas, wt. per cent	6.0	7.0	7.4	7.8
10 R.v.p. gasoline, vol. per cent	14.9	21.6	16.9	23.9
Gas oil, vol. per cent	75.5	66.5	70.9	59.3
Coke, wt. per cent	11.5	14.0	15.0	19.3
Gas-oil end point, °F. at 760 mm	830	830	900	900

TABLE 7
Utility Requirements—Contact and Delayed Coking

	Contact coking	Delayed coking
Cooling water, g.p.m.	4,660	8,750
High-pressure steam, lb. hr.	None	25,000
Electric power, kw.	210	90
Fuel, millions of B.t.u./hr.	79	115
Labor, operating men/shift	4	10

Basis: 19,000 bbl. per operating day of 18° A.P.I. reduced crude available at 650° F., generating steam from waste heat on coking units.



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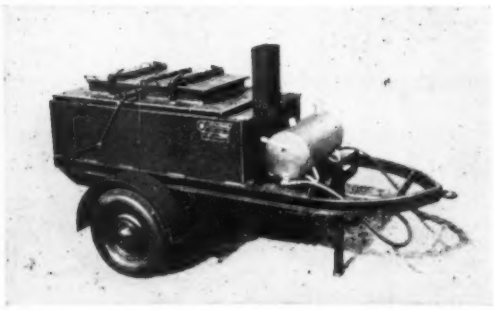

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uum bottoms and asphalts are not suitable charges for delayed coking, since they require heater outlet temperatures above 900° F. The contact coker is not limited by coking conditions in a fired coil heater, since the stream of circulating coke which largely controls the reactor bed temperature may be maintained at a wide range of temperatures without changing the oil-charge preheat.

When operating for maximum yield of catalytic cracking charge gas oil the degree of thermal cracking may be minimized in the contact coker by changing the reaction temperature, but if a maximum yield of intermediate boiling-range gas oil is required, the vapor cracking time may be varied independently of the liquid soaking time. Such independent variation is not possible in delayed coking.

If minimum coke yields should be desired, the operation may be carried out at relatively high reactor temperature and low oil partial pressure to obtain a very low coke yield and a small yield of fuel oil.

This flexibility may be of advantage in many refinery situations in helping the refiner to meet changes in the fuel-oil and coke markets and obtain the most valuable products from the residual stocks currently available.

Acknowledgment

The writers wish to acknowledge the contributions of the various laboratories for the work done in connection with the development of this process. The isothermal fixed-bed and continuous pilot plant coking runs were made at the Lummus Co. laboratories. The 50-bbl.-per-day pilot plant was operated by Standard Oil Co. (Ohio) at its Lima Refinery. The pilot-plant coking work on Venezuela stocks and the complete evaluation of the synthetic crudes from the Lima pilot unit were made by Gulf Research & Development Co. This included both Thermofor and fluid cracking of the products.

Maintenance Program In a Major Refinery

(Continued from page 73)

both cleaning cost and furnace down time; a prime factor in turnarounds.

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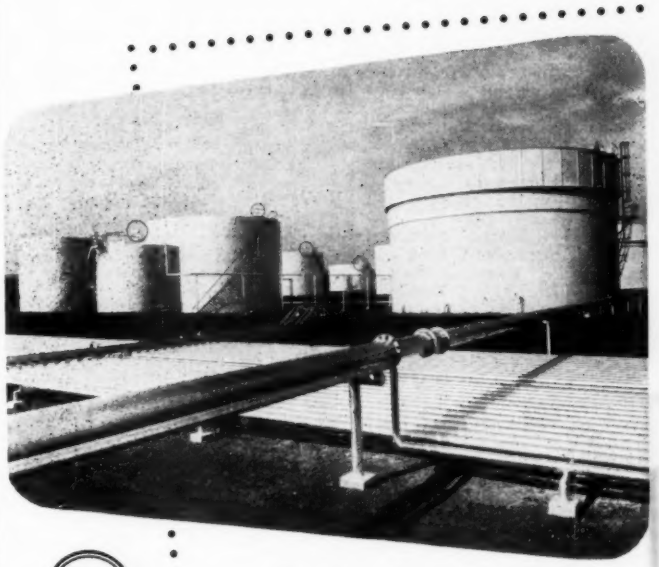

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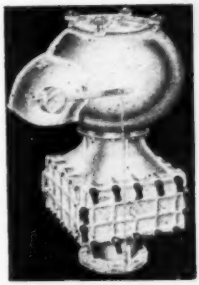

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necessary and tube temperatures are safely controlled.

Equipment required for this practice is relatively simple. Outside connections, manifolded and equipped with necessary switching valves, connect charge and transfer lines on the furnace to yard air and steam. Bends in this outside lines are cushioned to control erosion from ash and coke on the downstream side of combustion.

Improved cleaning methods for other equipment have been adapted to good use. Chemical cleaning by outside contractors is employed on many units such as fractionators, intercoolers, reboilers, surface condensers, boiler tubes, and wax molds. This policy takes advantage of specialized services at a saving in down time and equipment handling.

Vacuum cleaning has proved another time and labor saver, especially useful in turnarounds. Tank bottoms, spent filter clay, catalyst, and other solids and liquids are removed by a vacuum unit which showed an early payout and eliminated many undesirable shovel jobs.

Shop Facilities

Proper materials and equipment for implementing the new maintenance program are included under a plan which provides for:

1. Concentration of shops in one central area.
2. Rearrangement of and additions to existing shop facilities, roads, and trackage.
3. Increased mechanization.
4. Improved storage facilities.
5. Better methods and equipment for materials handling.
6. Revision of numerous maintenance methods.
7. Certain necessary organizational changes.

A central shop was accordingly installed and so laid out to afford a flow of routine repair work in assembly-line fashion through sections manned by six crafts. The single building has eight bays. Pipe, for example, moves in direct sequence through a threading and cutting section, to a bending shop, to stress relieving furnaces, to light or heavy welding areas where the line merges with steel plate from the boiler shop and materials for blacksmithing.

Storage of materials and supplies has also been merged for more efficient handling. Supplies formerly stored in five widely separated points through the refinery yard have been brought together in one central storehouse for better control and faster delivery to the job. The storehouse area comprises an office, a receiving area, a mezzanine storage area for general and chemical stores, and pipe racks. In the chemical section, palletization and lift trucks have increased space and time efficiency an estimated 300 per cent. In addition, demurrage charges on freight cars have been reduced, along with manpower requirements. Centralization of all stores has cut over-all delivery time to plant jobs an estimated 50 per cent.

Materials Handling

A transportation section was organized to maintain, service, and supervise all automotive units in the refinery. Centrally garaged are the following types of automotive equipment: scooters, jeeps, passenger cars, cargo trucks (½ to 3-ton capacity), load-lugger trucks, dragline, bulldozers, graders, front-end loader (scoop), auto cranes, and trailers. Two diesel-electric locomotives were procured. Under a better plan of switching and control, they replace four steam locomotives and handle more cars in 16 hours than were formerly handled in 24. Yard equipment also includes a 12 by 30 by 3½-ft. hydraulic dredge, used on the old river separator.

Of the five automatic cranes, one 20-ton unit replaces two similar steam cranes. Lift-truck booms find good use in handling rigging on turnaround jobs. Of the trailers, two flat-bed units are reserved as scaffold trailers and are kept loaded, one with lumber, the other with metal members. These are held in readiness for quick delivery to major jobs and emergency calls. The smallest trailers are ½-ton two-wheel units each of which carries the tools of an individual labor crew.

Two portable tool rooms were designed and fabricated for use on unit turnarounds and large jobs. They serve as tool control points located on the job.

Fifteen key vehicles in the plant fleet are equipped with two-way F.M. radios. This network has proved most useful in dispatching vehicles from job to job without return to the garage. It has been responsible in reducing the waiting time between the request to the dispatcher and delivery of a vehicle to an average of 6 minutes. It serves an additional purpose in emergency situations.

Hand Tools

The system of control and issuance of hand tools has undergone a marked revision. Under the new program, the company now will furnish all maintenance personnel with a full line of the best tools available for every craft. A tool supervisor, in charge of the tool section of the mechanical division controls their purchase, repair, and use. Tools are kept under a central inventory from which the proper items are selected and issued crews under each work order.

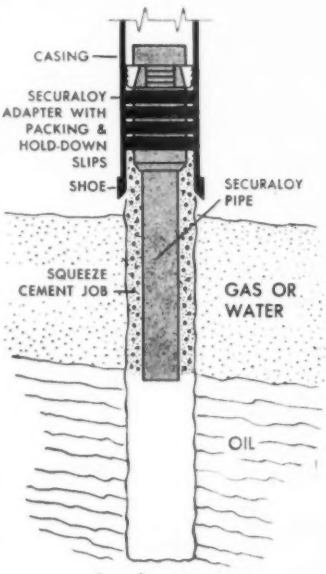
A procedure similar to the McKasky system is employed in issuing and checking all hand tools in and out. This over-all system has possibilities of materially reducing the tool stocks required for efficient employment.

USE OF SECURALOY SOLVES MANY PRODUCTION PROBLEMS

Securaloy pipe, which may be removed with chemicals or a drilling bit, is being used to solve many "difficult" production problems, such as correcting gas-oil ratios, water shutoffs and plug backs.

CORRECTING GAS-OIL RATIOS

This method is similar to that used in the case history shown on the opposite page except that the Securaloy pipe extends through the gas zone to the top of the oil zone.



Securaloy set on top of producing zone

This method is used where the entire oil zone can be produced from open hole and where it is not necessary to confine the oil production to selective strata. The hole through the oil zone is first filled with gravel. Securaloy pipe is run and squeeze cemented in position. When the cement has set, Securaloy cementing shoe and gravel are cleaned out and well is ready for production, with gas or water successfully under control.

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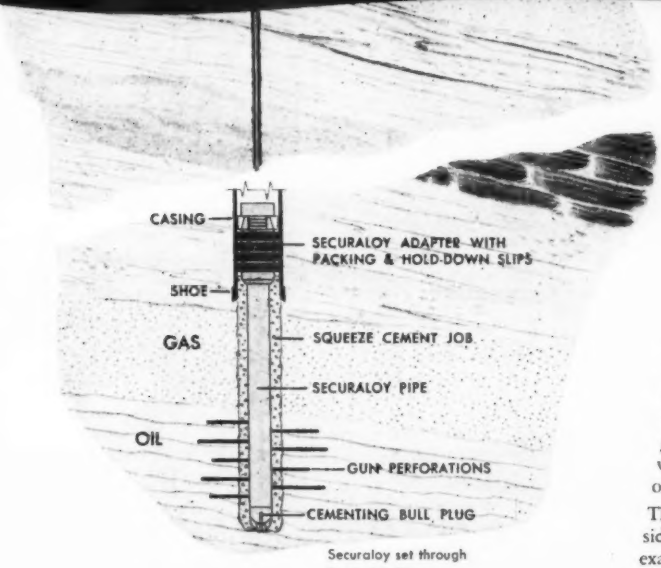


Securaloy set through Producing Zone

When a Texas operator found his gas-oil ratio too high and production way down he determined that the positive way to correct this situation was to use Securaloy. You, too, can profit by using Securaloy to solve your gas-oil ratio problems.

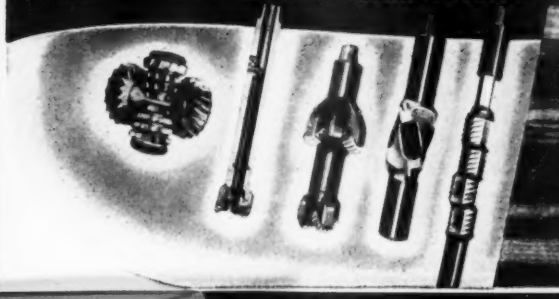
This operator first tried a plastic squeeze job, but the well still made only 6 barrels per day. Then a cement squeeze job was performed, with the entire open hole left full of cement and then drilled out. This proved unsuccessful too!

Finally, the operator cemented Securaloy pipe through the gas-oil sands, as shown. Selective strata were gun perforated and acidized. The well was then completed for 80 barrels of oil per day with a 40 to 1 gas-oil ratio!

This same remedial method is now considered standard practice . . . Another example of the application of Securaloy to solve your production problems.

Security

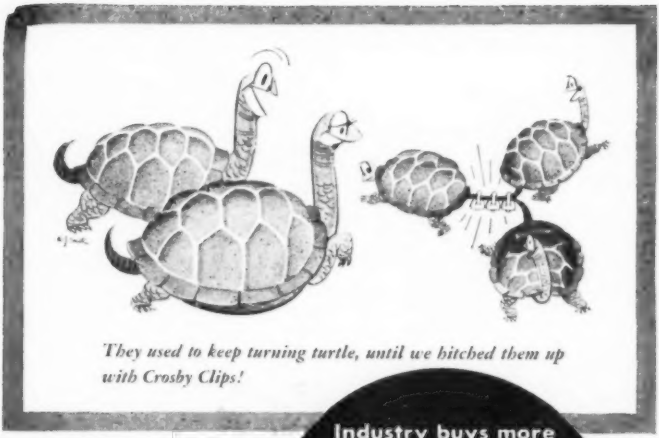
ROCK BITS • CORING BITS • HOLE OPENERS • REAMERS • CASING SCRAPERS



Securaloy

PRODUCTION EQUIPMENT

SECURITY ENGINEERING CO., INC.
ONE OF THE DRESSER INDUSTRIES
Main Office and Plant: Whittier, California
Branches in all of the major producing areas
Export Office: Chanin Building, New York City



They used to keep turning turtle, until we hitched them up with Crosby Clips!

Industry buys more

CROSBY CLIPS

than all other drop-forged fasteners!

9903

Fasten wire rope with CROSBY CLIPS. Safe, simple, speedy . . . applied anywhere by one man with one wrench. *Drop-forged*, not cast. Hot dip galvanized. All sizes . . . for ¼" to 3" wire rope. Distributors everywhere; made only by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minnesota.

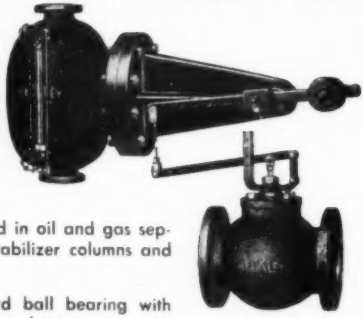
ALSO MAKERS OF THE AMERICAN HANDIWINCH AND AMERICAN BLOCKS AND SHEAVES

KECKLEY

No. 20 FLOAT BOXES WITH CONTROL VALVE

BALL BEARING STUFFING BOX

Semi steel 250 lbs.
Cast steel 400 lbs.



In the field and refineries, accurate automatic control of liquid levels must be maintained in oil and gas separators, fractionating towers, stabilizer columns and in tanks and receivers.

The packing box has outboard ball bearing with bolted gland reducing friction and wear to a minimum, the stem is stainless steel. A grease sealed packing box may be had when specified. Float Boxes are used in connection with closed tanks where fluctuation of the fluid level within the tank is the governing factor in the control of the tank valves, signal switches, motors and other equipment. The entire unit is outside the tank where it can easily be installed, adjusted and serviced.

Write for Description Bulletin No. 54

Pressure Regulators
Temperature Regulators
Float Valves
Steam Traps
Gauge Cocks
Strainers
Water Gauges

O. C. KECKLEY COMPANY

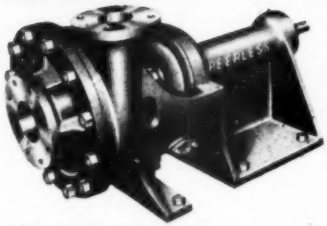
400 WEST MADISON STREET — **CHICAGO 6, ILLINOIS**

REFINEMENTS IN PUMP DESIGN REDUCE COSTS OF PUMPING CORROSIVES

Compare the pumps presently handling your corrosives with the Peerless Type ACO, especially developed for pumping acids and caustics. The Type ACO is a single stage, single suction pump with the volute and drip pocket cast integral, of special alloys to suit the solution being pumped. Bronze, stainless steel, Monel, NI-resist can be furnished. Stuffing box is long and extra deep with special opening affording easy accessibility. Drive is electric motor through flexible coupling. Capacities up to 800 g.p.m. can be handled against heads to 200 feet.

PEERLESS PUMPS

PEERLESS TYPE ACO PROCESS PUMPS FOR ACIDS • CAUSTICS



VENTED VOLUTE:
Special passage vents into discharge. Eliminates conventional screwed valve which often corrodes.

DRIP POCKET DRAIN:
A flange and two bolts which can be made of stainless steel replaces screw type fitting ordinarily used for this purpose.

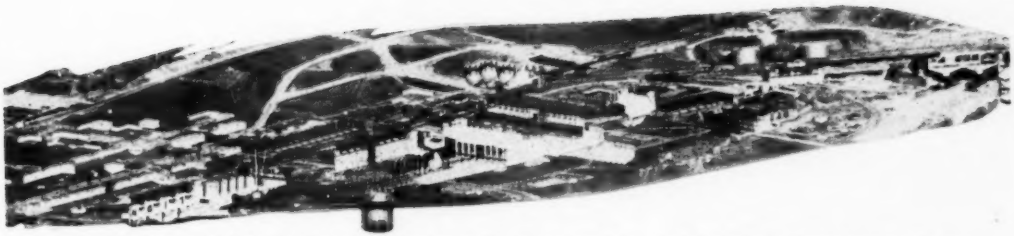
VERTICAL SPLIT:
Utilizes one piece circular gasket; easier handling and replacement assured by this design.

INBOARD END CAP:
Special alloy cap prevents liquid passing water slinger into bearing housing.

NEW BULLETIN: Fully describes and illustrates these and additional refinements in Type ACO design. Write for Bulletin D-2400.

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORP.

Factories, Los Angeles 31, Calif.; Indianapolis, Ind. District Offices: New York 5, 37 Wall Street; Chicago 40, 4554 North Broadway; Atlanta Office Rutland Building, Decatur, Georgia; Omaha, Nebraska, 4330 Leavenworth Street; Dallas 1, Texas 1905 Elm St.; Fresno, Calif.; Los Angeles 31, Calif.



Aerial view of Lion Oil Co.'s El Dorado, Ark., chemical plant. This modern plant produces synthetic nitrogen from natural gas

Lion Oil Expands Chemical Facilities at El Dorado

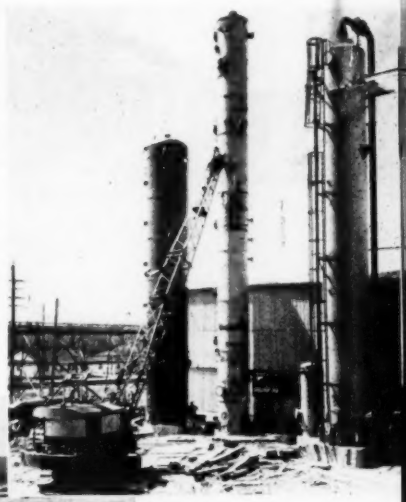
by D. H. Stormont
District Editor

EXPANSION of the chemical-plant facilities operated by Lion Oil Co. at El Dorado, Ark., is scheduled for completion by July 10. The project, estimated to cost $6,300,000, is to be tied into current operations.

A great part of the expansion program involves the enlargement of manufacturing facilities and includes four principal projects. Largest of the four projects incorporates enlargement of the facilities for the production of anhydrous ammonia which will provide a capacity of 570 tons per day, an increase of more than 30 per cent. This particular project includes extension of the gas-engine compressor units, enlargement of purification facilities, the addition of another high-pressure ammonia converter unit, together with required circulatory system and refrigeration, and expansion of the synthesis building. The new spheres of 1,300-ton capacity are also being added for pressure storage of ammonia. Total cost of this project is estimated at $3,500,000.

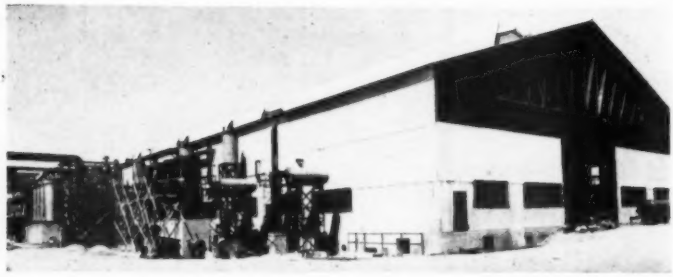
A sulfuric acid plant and an ammonium sulfate plant also included in the over-all project are scheduled to be in operation later this year.

The sulfuric acid plant is designed to burn 100 tons of sulfur per day to produce 300 tons daily of sulfuric acid. Except for small quantities used in other manufacturing operations this acid will be neutralized with 100 tons per day of ammonia to produce 380 tons per day of commercial-grade ammonium sulfate. Bulk storage is being provided for 4,000 tons of crystal sulfate of ammonia. Combined cost of

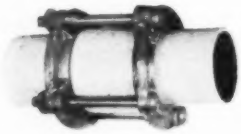


In the foreground of this view of Lion Oil Co.'s chemical plant may be seen partially completed foundations for the facilities where ammonium sulfate will be manufactured by mixing ammonia gas with 98 per cent sulfuric acid. In the final stages the mixture will be crystallized, centrifuged, and dried. Shells of the sulfuric acid absorption tower and the drying tower are shown in the center of this photograph. In the distance may be seen the ammonium nitrate pelleting plant. This plant is undergoing extensive revision and remodeling. The shot towers at the right, in which the pellets are formed, are being heightened to provide increased drying time

The two towers, left, are the main part of the new M.E.A. scrubbing system being installed to remove carbon dioxide from gas processed in the enlarged ammonia plant. The tower on the right is a water scrubber, part of Lion's original chemical plant at El Dorado



New refrigeration and process compressors are housed in the new 120-ft. extension to the compressor building shown here. This gas-driven compressor installation, including the original compressors, is believed to be the largest under one roof in the United States



COLLAR CLAMP

Styles 4 and 41, for repairing and preventing leaks through threads of screw collars.

BAND CLAMP

Style 77B, for repairing small leaks and holes in the run of pipe.

FIX LEAKS-without shutting down

Keep line contents moving while you stop leaks. Just put a Dresser Repair Clamp around the leaking pipe and tighten the bolts. Dresser Grade 29 Gaskets offer you special advantages for a permanent leak-proof seal.

Be ready for fast repairs by keeping Dressers in stock. The four styles shown here are just part of Dresser's complete line of repair products, available at your nearest oilfield supply store—or direct from our Houston warehouse. Overnight delivery throughout the southwest. For further details, write for our Oilfield Catalog.

POROUS-WELD CLAMP

Style 55, for repairing circumferential weld leaks.

SPLIT REPAIR CLAMP

Style 79B, for repairing pitholes and longitudinal splits in pipe.

DRESSER REPAIR CLAMPS

ONE OF THE DRESSER INDUSTRIES

Dresser Manufacturing Division, 59 Fisher Avenue, Bradford, Pa.
Houston Office and Warehouse: 1121 Rothwell Street, Houston, Texas
Sales Offices: New York, Chicago, Houston, San Francisco

the two plants will be about $2,000,000.

The ammonium nitrate pelleting plant is undergoing extensive revision and remodeling designed to increase capacity and improve product quality. These alterations are estimated to cost $800,000.

Other improvements were effected at the plant in addition to the larger items of the expansion program. Substantial capital additions to the nitrogen solutions plant were made to increase capacity and improve product specification control. Included in this project was the erection of a battery of aluminum tanks for greater facility in storage and blending operations.

The fleet of tank cars in nitrogen fertilizer solution service has been increased by the addition of 16 specially designed aluminum tank cars. Forty more of these cars are on order for delivery during the third quarter of 1949. To insure longer life of equipment, corrosion-resistant aluminum is being used in the manufacture, storage, and shipment of nitrogen solutions.

Superheaters Installed

Internal components of a new and improved design in the ammonia synthesis converters are being installed. Superheaters were installed on the four main boilers at the steam plant to provide superheated steam to the steam-turbo generators and increase general steam efficiency.

Roads, railroads, and utility lines are being expanded or rearranged as required by the increasing volume of operations.

Plant enlargement was designed and supervised by Chemical Construction Corp. of New York. This company also acted as architect-engineers, construction supervisors, and initial operators of the original Lion ammonia plant.

The company reports that "Lion Oil's chemical plant has been producing over 125,000 tons of synthetic nitrogen per year, an appreciable percentage of the nation's total production; and that an acute domestic and, in fact, world-wide shortage of nitrogen has prevailed for the past several years and is expected to continue. Nitrogen, as a basic ingredient for fertilizers, is vitally needed to bolster the world's food production."

This increase in the capacity of the Lion chemical plant provides an additional 50,000 tons annually of ammonia having a nitrogen content of approximately 83 per cent.

Stanolind Gives Fellowship

Stanolind Oil & Gas Co. has established a graduate fellowship in petroleum engineering at Texas A. & M. College. The first award will be made August 1.

HEAVY LOADS MOVE FASTER, SAFER, CHEAPER OFF AND ON THE HIGHWAY ON GENERAL'S DEEP-LUG, DUAL-PURPOSE TIRES

H.C.T. For the heavy load that must move from off the road on to the highway. Wide, thick, multi-directional tread ribs disperse the load over more of the strong, reinforced carcass. Deep lugs of rubber angle over the sturdy sidewalls for extra, non-skid, long-wearing service on-the-road . . . extra traction, extra protection against snags, bruises and cuts off-the-road. More rubber all around with more strength for more safe original miles—more dependable recap miles. More profits in every mile, every load, off and on the highway.

L.C.M. Designed for powerful traction to move heavy tonnage through mud, slush, rocks, sand and gravel. Extra-ply construction and high cord count per inch, the sturdy carcass takes tremendous loads and punishing treatment under the worst driving conditions. Thick lugs of rubber form a deep, self-cleaning tread and wide, sturdy, bruise-resistant sidewalls. No slipping or spinning, no costly bogging down on the job. More dependable service, more profit.

The GENERAL TRUCK TIRE

THE GENERAL TIRE & RUBBER CO., AKRON, OHIO

Texas Operator Cuts Equipment Cleaning Time 50%!

IN a recent all-out attempt to increase the production capacity of his processing units, a Texas operator tried cleaning his equipment with live steam and hot water. This method proved unsatisfactory, so he called in an Oakite Technical Service Representative. After careful study, the Oakite Technical Service Representative recommended circulation of a heavy-duty Oakite detergent through the entire system: absorber, heat exchanger, still, pre-heater.

Results—cleaning time halved! Fast-acting Oakite detergent quickly broke down carbonized deposits, grease films, sediment. Production flow was smoother . . . output increased!

Next time you have a problem of this nature—want to cut cleaning time, cut cleaning costs—contact your nearby Oakite Technical Service Representative. He'll be glad to work with you. Meantime, read how to solve 88 cleaning jobs in the Petroleum Industry. Send today for your free copy of Oakite Digest 88. Oakite Products, Inc., 44C Thames St., New York 6, N. Y.

OAKITE 1909 1949 40th ANNIVERSARY YEAR

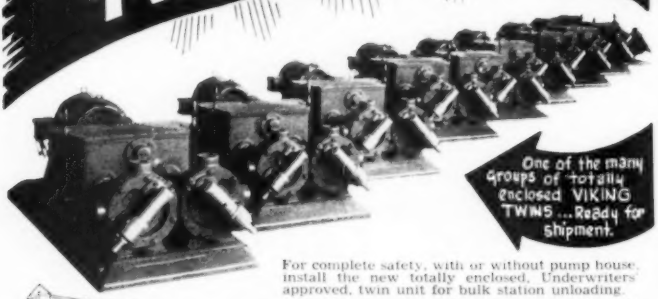
OAKITE

REG. U. S. PAT. OFF.

INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. & Canada

The VIKING "161" NEWEST IN BULK STATION TWIN UNITS....



For complete safety, with or without pump house, install the new totally enclosed, Underwriters' approved, twin unit for bulk station unloading.

Save the cost of a pump house . . . install right outdoors. It's weather proof, dust proof, water proof and explosion proof.

Either pump can be operated singly or in unison. All gearing and clutches installed in totally enclosed housing and run in a bath of oil. Both pumps complete with valve on head.

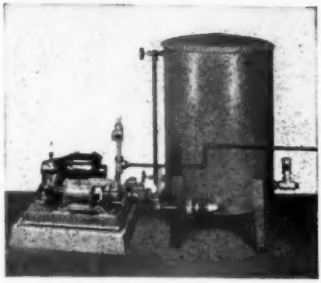
Write for free copy of bulletin B400T today.

VIKING AN HONORED NAME IN PUMPING

See Our Catalog In SWEETS

Viking PUMP COMPANY Cedar Falls, Iowa

MILTON Roy CHEMICAL PUMPS



Complete Feed Systems for Boiler Water Chemical Treatment

Milton Roy "Packaged" Units for chemically treating boiler water are available to feed sodium sulfite into the suction side of the feed water pump and to feed other chemicals, such as phosphates, soda ash and caustic directly into each boiler. Both methods are usually recommended for the correct treatment of boiler water.

- TO REMOVE DISSOLVED OXYGEN, INSURE AGAINST CORROSION AND PREVENT PITTING.
- TO PREVENT SCALE FORMATIONS, CONTROL ALKALINITY AND PREVENT EMBRITTLEMENT.

Units are complete with Milton Roy Pumps, tanks, gages, low-level pump cutouts and alarms . . . are available in a wide range of capacities to meet all requirements. Complete electronic controls and meters can be supplied to operate pumps automatically at rates directly proportional to feed water flow.

Write for Bulletin 451 also Technical Paper 51 "What the Power Engineer Needs to Know About Chemical Feed Systems for Water Treatment."

MILTON Roy COMPANY

Drilling and Completing Utah's Deepest Producer

(Continued from page 86)

in. o.d. casing, and, although the water locator survey failed to show that a faulty casing cement job was responsible for the water entry, the bottom of the 7-in. o.d. casing was squeeze cemented to preclude the possibility of water entry from behind the casing. The exposed formation below the casing was bridged over, using pea gravel and calseal before perforating a 5-ft. interval 50 ft. above the casing shoe and squeezing.

After drilling out, 12 days were spent in attempting unsuccessfully to recover a 30-ft. dump bailer, lost in the exposed formation below the casing during the bridging operations. Before retesting after the squeeze job, a cement and plastic-cap plug was placed on top of the uncovered bailer, leaving a total of 26 ft. of formation exposed below the casing. The exposed formation was then perforated with five 1-oz. shaped charges per foot as a precautionary measure in the event part of the cement used in squeezing had plugged the fractured formation.

A test was again made of the exposed formation utilizing conventional rod-type pumping equipment mounted on a 12-ft.-high platform built adjacent to, and level with, the derrick floor. In 60 days of continuous pumping, approximately 30,000 bbl. total fluid was pumped, averaging 25 per cent oil. Another attempt to exclude water was made by placing a 5-ft. plastic plug on the previous plug. A submergible electrical centrifugal pump was installed, resulting in an average pumping rate of 500 bbl. per day of practically clean oil. In 28 days of pumping, approximately 14,000 bbl. total fluid was pumped, averaging 90 per cent oil.

Deep-Tube Camera

(Continued from page 89)

is seen against a concentric-circle scale. In the photographs reproduced here, each circle represents 2°. Other scales are used depending on the known slope of the well being surveyed.

The photographs show the well casing to scale. With measurements taken from the prints and with casing thickness known it is possible to determine whether deformed portions of the casing can be forced back into position without causing an actual upset in the casing. Where limits of elasticity permit, such straightening may be done and the well put back in production.

A depth log is kept during the picture cycle. At each time interval set for the photographs, the distance the camera is in the well is recorded. This information is later correlated with the photographs taken at that depth. To check the time and position, a series of pictures is taken at the initial depth before the camera is started up or down for the photo survey.

So far six wells have been photographed in the Terminal Island area. Various types of failures have been recorded. In all instances the casing faults were found within a close depth interval. The interval of failure centers around 1,600 ft. Most of the photographs show a greater depth but this is due to the angle at which most of the wells are drilled in this field. The evidence brought up by the camera has been extremely valuable in locating and tracing the difficulties in the Terminal Island wells.

In addition to the oil wells surveyed, photographs have been taken in the Long Beach city water wells. The purpose was to check casing perforations. Water depth averaged 1,000 ft. The well perforations were shown to be plugged in many cases as a result of the migrating of clay from formations either above or below the water-producing zone.

STRIP MAPS
for pipe line location

Edgar Tobin Aerial Surveys - with $7,500,000 invested in completed aerial maps - is an organization of more than 300 specialists, prepared to supply strip maps for pipe line location with maximum speed - at minimum cost. Photographic and regional base maps are immediately available for over 500,000 square miles of territory. County ownership maps comprising 268,250 square miles have been completed.

We have made right-of-way strip maps for the following companies:

Plantation Pipe Line Co.
Humble Pipe Line Co.
Texas Pipe Line Co.
Shell Pipe Line Co.
Magnolia Pipe Line Co.
Atlantic Pipe Line Co.
Standard Oil Co. of N. J.
Great Lakes Pipe Line Co.
Big Inch Pipe Line*
Little Inch Pipe Line*
American Tel. and Tel. Co.
S. W. Bell Telephone Co.
Tennessee Gas Pipe Line Co.
Phillips Pipe Line Co.
Houston Natural Gas Co.
Texas State Highway Dept.
Texas Eastern Pipe Line Co.
Transcontinental Gas Pipe Line Co.
Arkansas Power & Light Co.

*Built by Government

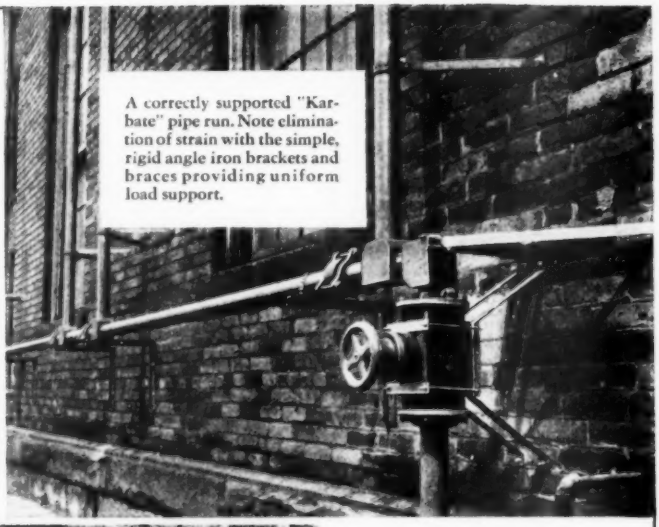
Inquiries invited, without obligation.

EDGAR TOBIN AERIAL SURVEYS

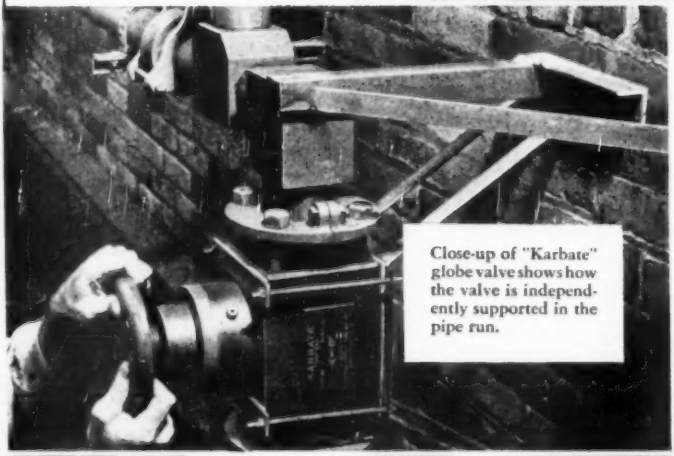
OFFICES: 502 W. MISTLETOE, SAN ANTONIO 1, TEXAS

THE MAPPING AGENCY FOR THE OIL INDUSTRY

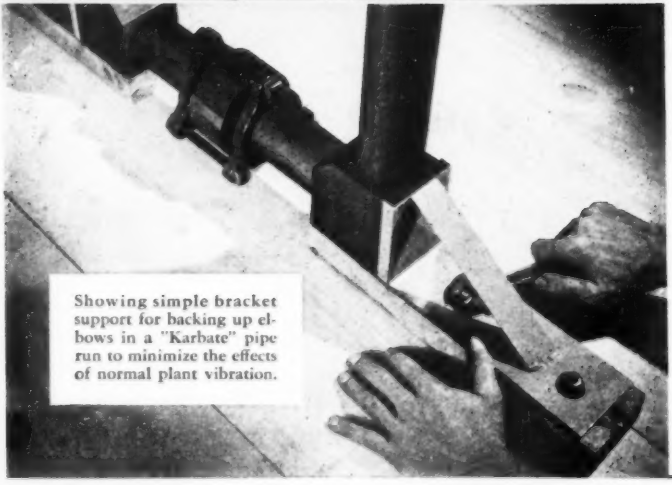
How to support a "Karbate" pipe line-



A correctly supported "Karbate" pipe run. Note elimination of strain with the simple, rigid angle iron brackets and braces providing uniform load support.



Close-up of "Karbate" globe valve shows how the valve is independently supported in the pipe run.



Showing simple bracket support for backing up elbows in a "Karbate" pipe run to minimize the effects of normal plant vibration.

KEEP "KARBATE" PIPE ALWAYS IN STOCK

- Resists the action of acids, alkalies and other chemicals
- Light weight with adequate strength
- Resistant to mechanical shock
- Immune to thermal shock
- Easy to machine and install
- Full range of sizes and fittings

Write for Installation Manual M-8801 A. Address Dept. OG.

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NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Refrigeration Auxiliaries

REFRIGERATION COST-IMATING

The following Cost-imating installments are useful in estimating refrigeration plants:

Exchangers—No. 2, October 28, 1948—Air-cooled condensers (economizers) complete with fans and motors—and liquid coolers.

Construction Steel—No. 3, November 4, 1948—Frames, walkways, etc., for refrigeration or cold storage equipment.

Vessels—No. 9, December 16, 1948—Drums, surge tanks, vessels or storage tanks.

Pipe Insulation—No. 15, January 27, 1949—Steam line insulation.

Insulation for Cold I—No. 16, February 3, 1949—Insulation thicknesses and pipe and block insulation.

Cork Covers for Fittings—No. 17, February 10, 1949—Moulded covers for fittings and flanges.

Ladders, Walkways and Platforms—No. 18, February 17, 1949.

Cost of Buildings—No. 22, March 17, 1949—Industrial buildings.

Pumps—No. 29, May 5, 1949—Centrifugal and reciprocating pumps.

Motors and Drives—Nos. 30 and 31, May 12 and 19, 1949—Motors and special pump materials.

Electrical Equipment—No. 32, May 26, 1949—Feed lines, starters, conduit and wiring.

Instruments—No. 35, June 16, 1949—Control instruments.

Compressors—Nos. 36 and 37, June 23 and 30, 1949.

Refrigeration Plants—No. 38, July 7, 1949—Plants and cost index.

This issue—The cost of special auxiliaries.

THE costs of many of the parts of a refrigeration plant and auxiliary equipment are indicated in the box on this page, entitled, "Refrigeration Cost-imating." Note that the refrigeration plant costs (Tables 1 and 2) of Cost-imating No. 38, July 7, contemplated the use of tubular condensers cooled with city water. If other means of condensing are employed the following extra costs should be added:

Well water—the cost of the well, pump and piping.
Cooling-tower water—$52-$60 per ton of refrigeration, but this does not include the cost of rigging the tower or the electrical wiring of the pump.

Evaporative condensers—$35-$42 per ton of refrigeration, but this does not include structural supports or electrical wiring.

Insulation—Although insulation was discussed in Cost-imating Nos. 16 and 17 (February 3 and 10), Table 1 shown here is less complicated and it contains some newer information. The approximate cost of cold storage rooms is indicated in Table 2.

TABLE 1—COST OF INSULATION, INSTALLED (1946 = 100)*

Pipe diameter, or block thickness (in.)	Walls, ceilings and floors† ($ per sq. ft.)	Pipe insulation‡ ($ per ft.) BT	STB	IWT
½		0.79- 1.15	1.25- 2.03	0.66-1.03
1		0.99- 1.45	1.54- 2.70	0.80-1.24
1½		1.44- 2.22	1.72- 3.28	0.93-1.45
2		1.50- 2.32	2.08- 3.66	1.03-1.66
3		2.10- 3.38	2.35- 4.34	1.23-2.28
4	0.98-2.17	2.52- 3.86	3.14- 5.40	1.70-3.10
6	1.33-2.62	3.37- 5.78	4.62- 8.10	2.79-4.35
8	1.66-3.37	4.44- 7.25	7.70-10.80	3.64-5.71
10	2.08-3.83	7.30-10.60	8.80-13.50	5.72-7.84

*The high costs are for outdoor locations (asphalt and plaster finish) and installed at 15-ft. or more elevation. †Including interior finish and doors. ‡Add about 20 per cent for a canvas jacket. If the lengths are short (under 50 ft.) add 50 per cent.

TABLE 2—APPROXIMATE COST (1946) OF COLD STORAGE ROOMS*

Capacity—	Temp. (°F.)	Dollars per cu. ft. M.	L.	R.†	Total
Under 50,000 cu. ft.	35	0.36	0.30	0.18	0.94
Under 25,000 cu. ft.	0	0.36	0.42	0.30	1.18
Under 25,000 cu. ft.	—20	0.36	0.54	0.42	1.32

*Chem. Eng., May 1947, pages 125 and 138. †Refrigeration coils, etc.

Condensers—Evaporative condensers cost about the same as the standard heat exchangers of Cost-imating No. 2 (October 28, 1948) but the costs of horizontal or vertical water-cooled condensers and of water coolers used in refrigeration work are slightly lower (see Table 3).

TABLE 3—COSTS (1946) OF WATER COOLERS AND REFRIGERATION CONDENSERS*

Total area (sq. ft.)	$ per sq. ft.	Total area (sq. ft.)	$ per sq. ft.
100	6-7	1,400	1.92-2.90
200	4.70-5.70	2,000	1.92-2.60
400	3.30-4.30	3,000	1.92-2.40
800	2.50-3.40	5,000	1.85-2.30

*Excluding evaporative condensers.

No. 39 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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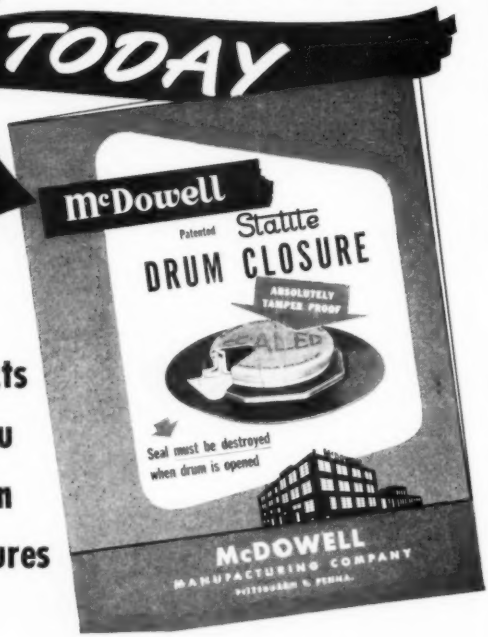

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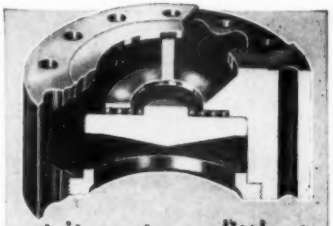

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ENGINEERING fundamentals

Phase Behavior—The Critical Point

IN the previous installment of Engineering Fundamentals the change of phases in a two-component system were discussed. It was noted that the commonly expected transition from two phases to a single-phase liquid by application of pressure might not occur above the critical temperature. Inasmuch as the concept of a critical point enters often into phase discussions it is of interest further to define it.

For a single-component system the critical point is defined as that point of pressure and temperature above which there is no transition between phases. Such a definition does not apply to a multicomponent system because two phases can exist above the critical pressure or critical temperature. The critical point is applied therefore to that point at which the bubble point line and the dew-point line meet, or more exactly to that point at which the vapor and liquid have identical properties. This point can be determined experimentally by observation of liquid formation and properties in a P.V.T. cell.

As is indicated in Fig. 1, which is one type of phase diagram, the dew-point line may double back on itself to give a critical temperature (marked C) less than the maximum temperature of the dew-point line. This latter temperature (marked A) is termed the cricondentherm. For different mixtures the critical point may be at almost any position on the boundary of the two-phase region. The bubble-point line may double back rather than the dew-point line. This depends on the composition of the mixture.

Point of Nomenclature

This gives rise to a point of nomenclature which is often confusing to the initiate in phase behavior. For a single-component system one speaks of a vapor existing below the vapor-pressure line and a liquid existing above the vapor-pressure line. For the two-component system one speaks of the region below the dew-point line as being vapor phase and that above the bubble-point line as being liquid phase. Inasmuch as the dew-point line may double back in temperature, that region above the two-phase boundary line and between the points C and A of Fig. 1 would be designated as vapor. Thus in passing from point P_3 to point P_4 one would pass from a two-phase system to a vapor-phase system upon addition of pressure, but in passing from P_2 to P_4 one would pass from a two-phase system to a liquid system upon addition of pressure. In other words, immediately to the left of point C one would refer technically to a liquid phase and to the right of point C to a vapor phase.

The important differentiation for application of phase concepts to engineering problems is between single-phase and two-phase behavior. A sample taken directly to the left of point C, although technically classed as liquid, would display physical characteristics (i.e., density, compressibility, etc.) very similar to that of a sample taken directly to the right of point C where it would be classed technically as a vapor. Both samples, however, would be single phase and they would possess similar properties. Thus, the commonly held concept of the differences between gases and vapors loses its significance.

As gases are compressed to those pressures above the critical their physical properties approach those of a liquid. This is illustrated in Fig. 2 which shows the variation of specific volume for a single-component system at two different pressures, one below the critical temperature and one above the critical temperature. In the former the changes from single-phase vapor to two phases (point A) and from single-phase liquid to two phases (point A') are marked by a sharp break in properties. At the temperature above the critical there is no such break.

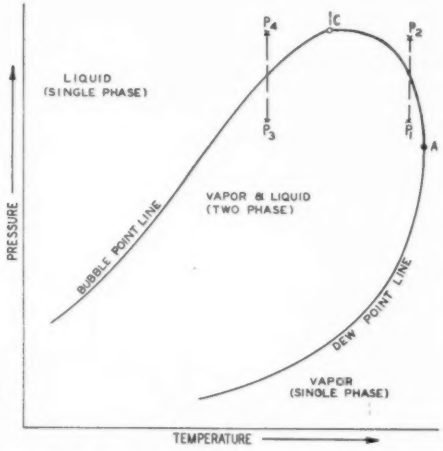

Fig. 1—Schematic representation of pressure-temperature plot of two-component system

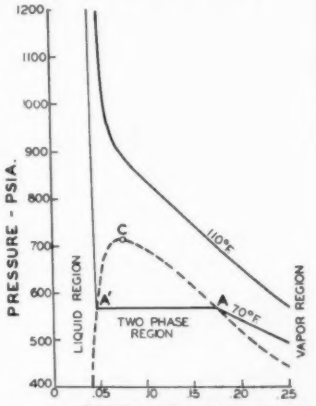

Fig. 2—Chart showing smooth transition from vapor characteristics to liquid characteristics above the critical point. (Reference: Fig. 1, page 1, Natural Gasoline and the Volatile Hydrocarbons, by Brown, Katz, Oberfell, and Alden)

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

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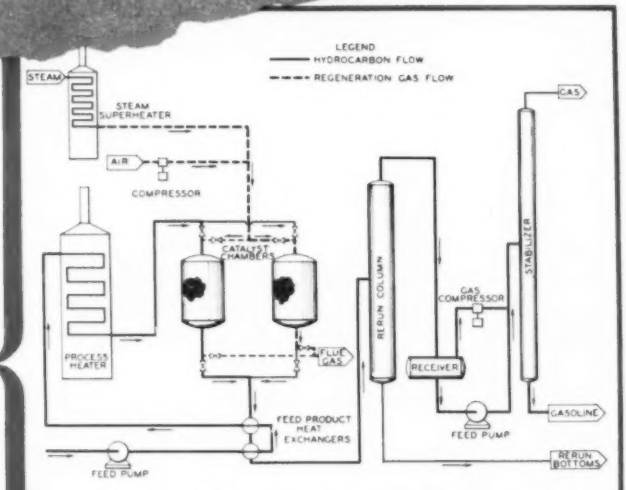

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REFINING

Oil City Refinery Workers Granted New Wage Increase

Hourly wage increases, ranging from 8 to 14½ cents in various job classifications are among benefits included in a contract signed last week by officials of Quaker State Oil Refining Co.'s Farmers Valley plant, and officers of Local 607, Oil Workers International (C.I.O.).

The union won the right to bargain for the employes of the plant next March. The 1-year contract is automatically reopened at the end of 1 year on 60 days' notice by either management or employes.

New provisions provide for seniority in promotion through departments of the plant, irrevocable checkoff (a provision designed to protect the union shop through the period of the agreement); a 3-week vacation after 20 years' service instead of 2 weeks; and increased sick and injury benefits.

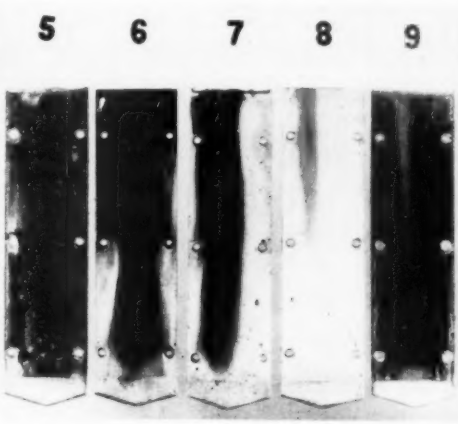
MACHINE EVALUATES ADDITIVE-TREATED LUBE OILS

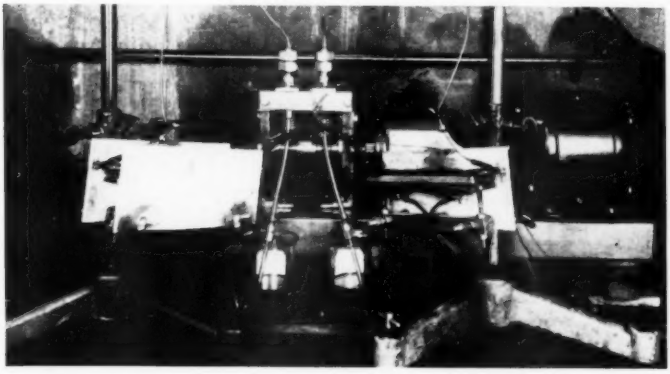
An apparatus has been developed at the National Bureau of Standards for laboratory evaluation of additive-treated lubricating oils. This method provides results that correlate well with actual engine performance.

Oil is made to flow in a thin film at a regular rate over a weighed steel strip which is maintained at an elevated temperature. The oil is recirculated for a definite period. Shields (see bottom picture) prevent air currents from affecting the results (one of the shields on the right assembly has been removed.)

After washing by a method which removes any adhering oil without loss of the deposit, the strip is again weighed to obtain numerical and visual indication of the amount of deposit formed.

Test strips showing the effectiveness of various additives in a Mid-Continent, solvent-extracted oil, as revealed by the National Bureau of Standards' new stability test appear in the top picture. Formation on strip 5 resulted from a straight oil whereas sample 6 contained oxidation in-





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hibitor but no detergent; sample 7; a premium additive with some inhibitor and detergent; sample 8, a premium additive with the full amount inhibitor and detergent; and sample 9, with a detergent but no inhibitor.

Work to Start Soon on New Refinery at Alba, Tex.

Work is scheduled to start soon on a refinery that will handle 1,000 bbl. of crude oil daily, at Alba, Tex. The plant will be operated by the Alba Oil & Refining Co.

According to reports, the refinery is to be financed by a group of Houston and other South Texas oil men. The new plant is expected to boost development of the Alba oil field, which now has 16 wells.

Increase in Allowable-Vapor Pressure Planned at A.S.T.M.

PHILADELPHIA.—At the fifty-second annual meeting of the American Society for Testing Materials, 22 technical sessions were combined with meetings of the society's many technical committees. Papers presented were largely of fringe interest to the petroleum industry. Action of Committee D-2 on Petroleum Products and Lubricants was confined to the presentation of the annual report which listed activities and recommendations of the various subcommittees.

No action was taken on any D-2 recommendations or proposals, but a letter ballot is being made on certain points this summer. Of particular interest to refiners and natural-gasoline manufacturers was a proposal tendered by Section V on Specifications and Significance of Tests, of Technical Committee A on Gasoline. The section reported that it is "carrying on a special investigation of climatic conditions throughout the country as they affect the vapor pressure of gasoline."

N.P.A. Accident-Prevention Department Names Officers

The fire and accident-prevention department, National Petroleum Association, held its annual meeting June 24 at Pure Oil Co.'s Heath refinery near Newark, Ohio, during which time officers of the group were elected for the ensuing year.

H. C. Salisbury, Kendall Refining Co., Bradford, Pa., was named president, replacing Retiring President L. E. McArthur, Ashland Oil & Refining Co., Canton, Ohio. Other officers include: Russell Potts, Mount Vernon, Ind., and F. A. Nicholson, Elk Refining Co., Falling Rock, W. Va., vice presidents; W. E. Dunning, Freedom-Valvoline, Freedom, Pa., treasurer; and Theron Arras, National Refining Co., Findlay, Ohio, secretary. Members of the executive committee elected include: C. K. Roof, Pure Oil Co., Newark, chairman; Frank Sluze, Ashland Oil & Refining Co., Ashland, Ky., Potts; J. H. Weiser, Quaker State Refining Co., Oil City, Pa.; Charles Ives, Sinclair refining Co., Wellsville, N. Y.; and Harry Elkins, National Petroleum Association, Washington, D. C., counselor.

Tom A. Burke, director of local safety programs for the National Safety Council, and Harry Bennett, field engineer for Universal Oil Products Corp., both of Chicago, were special speakers during the meeting.

Two Newark employes at Pure's refinery were awarded certificates of achievements during the meeting. They were Arthur Ray Hickman and William E. Nikolaus, both mechanics in the maintenance division. Their awards, respectively, were for construction of a new-type "A" frame which is demountable, and development of a new tool and technique to test heavy-weight relief valves without removing the valves from location.

Labor Difficulties Close Crown Central's Refinery

HOUSTON.—Labor difficulty last week caused closing down of Crown Central Petroleum Corp.'s Pasadena, Tex., refinery near here.

Crown ceased operations in its 26,000 bbl. refinery after accusing its employes of a new-type sitdown strike. Company officials claimed workers were spending a good portion of their company time writing out grievances. This is permitted under the Taft-Hartley law, but Crown claimed the privilege was being abused. On the other hand, union spokesmen described the shutdown as a "lockout."

The contract between the company and union expired on July 1. Negotiations had been under way since June 7, but were broken off on July 3.

Crown Central shut down its plant, employing approximately 350 persons, "for the safety of the community, the plant, and the workers." It offered to reopen the refinery as soon as union employes "permit order and discipline to be returned to the plant," according to a letter signed by K. W. Shimeall, Baltimore, vice president of the company.

Humble Receiving Bids on Baytown Refinery Expansion

HOUSTON.—Humble Oil & Refining Co. is receiving bids for an estimated $1,000,000 worth of additional facilities at its Baytown refinery, the largest in the United States.

New facilities will include a warehouse and shop building of 56,000 sq. ft., a 1-story mezzanine-equipment building of 2,500 sq. ft., an outside storage yard of 120,000 sq. ft. of pavement, and necessary railroad trackage.

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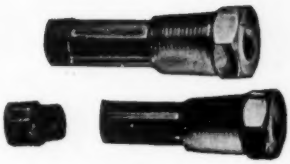

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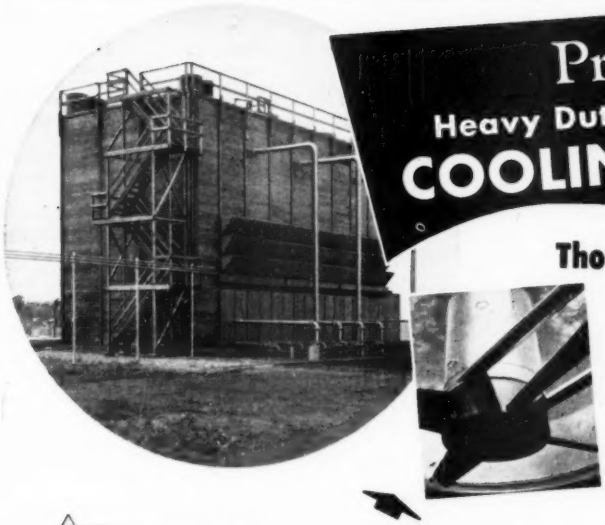

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NATURAL GAS

Oral Argument July 22 on Atlantic Seaboard Request

Intermediate-decision procedure has been ordered omitted by Federal Power Commission, and oral argument is scheduled to be held July 22 in Washington, D. C., in the proceeding involving Atlantic Seaboard Corp.'s application for FPC authority to sell and deliver natural gas to Consolidated Gas Electric Light & Power Co. of Baltimore, and to install measuring and regulating stations to measure the gas proposed for delivery to the Baltimore firm.

Both actions were requested by Consolidated Gas in order to speed final FPC determination in the proceeding. Unless the commission acts by the end of July, Consolidated said the proposed change-over to natural-gas service in the Baltimore area and the company's promised rate reduction of about $7,500,000 which depends on the change-over would be delayed a year.

Atlantic Seaboard, subsidiary of Columbia Gas System, Inc., proposes to build the three measuring and regulating stations at an estimated cost of $255,000.

Dry Gas Put to Use for First Time at McCarthy

In what was described as the first known use of dry gas, McCarthy Chemical Co. plant near Winnie, Tex., began shipment last week of acetaldehyde from the gas previously flared into the air.

The company uses a process developed by J. E. Bludworth in producing the chemical from dry gas, the end product of natural gas stripped of all other values.

Acetaldehyde is used in producing plastics and previously had been made commercially only from grain alcohol, propane, or butane. The company's Houston plant also shipped some railway tank-car loads of menthenol, used in manufacture of antifreeze.

Natural-Gas Line Approved In Queens, New York City

The New York City Public Service Commission has authorized Consolidated Edison Co. to construct 3½ miles of gas main in Queens at a cost of $1,100,000 to carry natural gas.

Authorization is the initial step in a master plan, in which several other utility companies are cooperating to make natural gas available in Brooklyn, Queens, and the area on Long Island outside the city limits served by Long Island Lighting System.

Consolidated Edison said that natural gas was wanted chiefly as a substitute for fuel oil used in making manufactured gas from coal, but that a catalytic cracking plant would be erected at Flushing, Queens, to make natural gas suitable for home use if the demand made such a plant advisable.

The firm has a contract with Transcontinental Gas Pipe Line Corp. for a supply of gas when the latter's 1,800-mile transmission system, now under construction, is brought to the Manhattan side of the Hudson River at 132nd Street. The line is expected to be completed in time for use during the 1950-51 winter.

Carbon-Black Units Moved From Texas to New Mexico

Several carbon-black producing units have been transferred from Sunray, Tex., to Eunice, N. M., by Continental Carbon Co.

The producing units, in their new location, will produce an additional 1,200,000 lb. per month of channel black. This type of black constitutes more than half of the total amount used by the rubber industry. Subsequently, the increased production will assist in assuring adequate supplies of the important raw material.

200 Miles of New Texas Transmission Line Laid

Texas Gas Transmission Corp. announced last week that construction crews working on the company's 800-mile Texas-to-Ohio natural-gas pipe line have put approximately 200 miles of pipe in the ground. Crews are now working on schedule on the 26-in. pipe-line project.

W. T. Stevenson, executive vice president of the firm, said that Texas Gas Transmission expects to have the pipe line in preliminary operation by the end of the year in time to deliver natural-gas supplies to meet the winter's needs. Work started 2½ months ago.

Following completion of the line the company's system will include 2,366 miles of pipe line, compared with the present 1,501 miles. Annual natural-gas sales are expected to reach approximately 150,000,000,000 cu. ft., an increase of 100,000,000,000 cu. ft. a year over present sales.

Compressor stations along the system will number 17 compared with the 8 now in operation. Installed compressor horsepower will total 97,915 compared to the present 29,115 hp.

Initial capacity of the new line at the end of the year is expected to reach 304,000,000 cu. ft. daily and by the spring of 1950, upon completion of additional facilities, capacity of the 26-in. line will reach 400,000,000 cu. ft. daily, making the firm's total daily delivery capacity approximately 650,000,000 cu. ft.

Central Kentucky Gets FPC Approval for Construction

Central Kentucky Natural Gas Co., Charleston, W. Va., has been given Federal Power Commission authority to construct additional natural-gas facilities designed to increase the company's deliveries in northeastern Kentucky and the Cincinnati market area. Estimated cost of the project is $1,643,200.

The firm was authorized to construct 23 miles of loop line between Menifee and Mt. Sterling, Ky., 12,500 ft. of line from Tennessee Gas Transmission Co.'s measuring station at South Means, Ky., to Central Kentucky's Menifee compressing station; and six additional compressor units.

Central Kentucky Natural said the newly authorized facilities will enable it to provide adequate service during the coming winter to wholesale customers in the Cincinnati market area to retail customers in Cynthiana, Winchester, Lexington, Mt. Sterling, and Georgetown, Ky. Wholesale sales to Kentucky Utilities Co., Paris, Ky., and the City of North Middleton, Ky., also will be increased.

G.A.M.A. Says Homes Using Gas Now Total 25,776,000

The Gas Appliance Manufacturers Association, Inc., has issued a report showing that 25,776,000 homes in the United States were using gas for cooking on December 31, 1948, representing an increase of 56 per cent in the last 10 years. The gas industry serves 9,241,000 more homes than it did on December 31, 1938.

Hearing Postponed by FPC

The Federal Power Commission hearing previously scheduled to begin July 11 in Washington, D. C., has been further postponed until August 8 in the proceeding involving an investigation instituted by the commission of rates charged by United Natural Gas Co. for sale of natural gas subject to FPC jurisdiction. Postponement was requested by the company.

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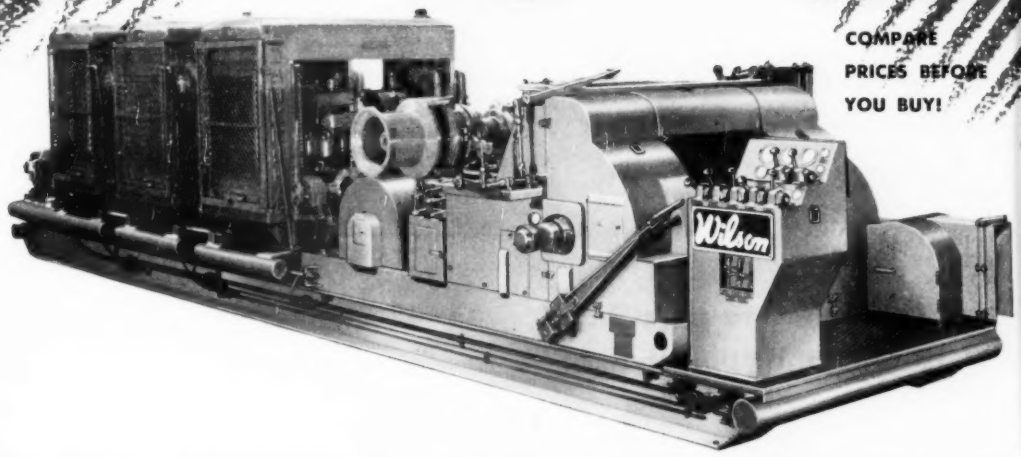

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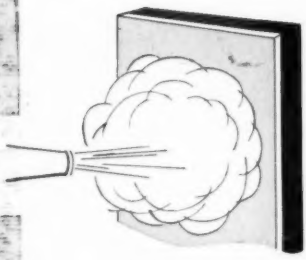
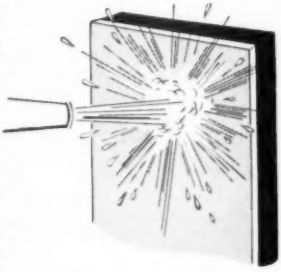
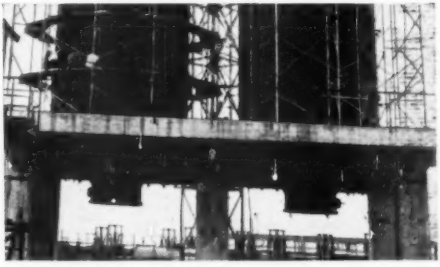


THEN 60° WATER AT 1500 LBS.





Stainless-Clad Steel decoking tower of Cities Service Oil Company, East Chicago, Indiana, built by Chicago Bridge & Iron Company, Chicago, Ill.

"There has to be a bond to take that punishment"

A materials engineer for an oil refining company was telling why he insisted on a Lukens Clad Steel, with its permanent bond between cladding and backing plate, for their decoking tower.

"Even under those severe conditions, there will be no separation of the metals. We get protection of the equipment and our products from the clad surface, and the bond prevents corrosive materials from creeping in to attack the base metal."

You get this permanence of bond and uniformity of cladding in all Lukens Clad Steels—Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad. Thus you can obtain the benefits of these *solid* corrosion-resistant metals with the economies possible with *clad* steels.

Lukens makes clad steel plate as wide as 178 inches, or as thick as 6 inches—all in the extra-smooth sodium hydride finish. Applications in the Petroleum Industry are described in Bulletin 461. For a copy, write Lukens Steel Company, 455 Lukens Bldg., Coatesville, Pennsylvania.

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LUKENS

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STEELS

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PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

Castings for Heat and Corrosion Resistance

MUCH the same alloy elements are used in both the heat-resistant and the corrosion-resistant castings. There is even more overlap in the composition of these materials and some of the A.P.I. wrought stainless steels. In other words, the very alloy elements that impart corrosion resistance at temperatures below 900° F. (or 1,200° F) also impart strength at elevated temperatures. In some instances the same chemical composition, except for minor differences, would be employed for both services. However, in many situations the apparently slight difference in composition between heat-resistant and corrosion-resistant alloys are highly important to the fabricator. The situation has been ably discussed in the March issue of Nickel Topics of International Nickel Co., and much of the following discussion was taken from them.

The Handbook of the American Society for Metals classifies castings as corrosion-resistant if they can be continuously exposed to attack by corrosive agents at metal temperatures lower than 900° F., and as heat resistant if capable of sustained operation when exposed, either continuously or intermittently, to metal temperatures in excess of 900° F. However, the Alloy Casting Institute sets the line of demarcation at 1,200° F. Table 1 shows the standard designations of the A.C.I., with their composition ranges.

The austenitic corrosion-resistant cast alloys employing chromium and nickel are, like their wrought "stainless steel" counterparts, widely used in equipment in the chemical industries, in food processing, oil refining, textile and paper mills, and various other applications involving exposure to corrosive substances. They are melted in electric furnaces and are usually specially heat treated to prevent carbide precipitation.

Heat-resistant alloys are principally used in metallurgical furnaces, in oil-refinery and cement-mill furnaces, and in power-plant equipment exposed to elevated temperatures. They are also used for turbosupercharger, gas-turbine, and jet-engine parts. They are produced in electric-arc or induction furnaces, and are ordinarily not heat treated.

The alloys listed in Table 2 from HC to HL inclusive, which contain more chromium than nickel, are recommended for **oxidizing or reducing conditions** of use where good strength and ductility at elevated temperatures are required, and where sulfur-containing gases are present.

Alloys HC and HD are recommended for high-temperature applications where strength is not a factor and for high-sulfur atmospheres. HF is highly resistant to oxidation at temperatures up to 1,600° F., and HE can be used up to 2,000° F.

Alloy HH and others of the nominal 25 per cent Cr—12 per cent Ni composition comprise about one-third of the total production of heat-resistant castings. They have good strength and oxidation resistance up to 2,000° F.

The HK and HL ("25-20" chromium-nickel) grades are widely used for general structural applications up to 2,100° F.

The higher-nickel types (HT to HX inclusive, Table 2) are recommended for load carrying at the higher temperatures, and for **reducing** as well as **oxidizing atmospheres,** except where sulfur-containing gases are present in appreciable quantity. They do not carburize readily or become brittle and do not absorb nitrogen. In general, the resistance to carburizing and nitriding atmospheres increases with nickel content. These high-nickel-chromium alloys are especially resistant to deterioration under severe temperature fluctuations (thermal shock) and are hence most suitable for quenching fixtures or other intermittently heated and cooled parts. Like wrought alloys of somewhat similar composition, the higher-nickel heat-resistant alloys possess electrical resistance properties that make them useful for electrical heating elements.

It will be noted that alloys CE-30 (Table 1) and HE (Table 2) are similar in nickel and chromium contents, and differ essentially only in the higher maximum carbon content permitted in the heat resistant (HE) grade. Similarly, there are very close resemblances in composition between the CF series and the heat resistant alloy HF.

While the cast alloys of the CF series correspond in composition rather closely with wrought stainless steels of the A.I.S.I. 302 and 304 types, as do CG-12 and CH-10 to Type 309, and CK-20 to Type 310, there are essential differences. The exact balance of the major and minor constituents depends upon the requirements of rolling or forging on the one hand, and the requirements of casting on the other. Consequently, alloy composition ranges specified for wrought shapes usually are not suitable for castings, and vice versa, even though similar wrought and cast grades exhibit comparable corrosion resistance.

It is a fairly common practice, unfortunately, for prospective users of high-alloy castings who have had favorable experience with various stainless steels in wrought forms to send inquiries or orders to alloy foundries specifying certain A.I.S.I. "types." The preferred and most efficient procedure is to specify the correct Alloy Casting Institute standard designation, or, better yet, to consult with the producing foundry.

TABLE 1—PRIMARILY CORROSION-RESISTANT CASTING COMPOSITIONS

Designation—	Composition, per cent* C	Mn max.	Si	CR	Ni	Other elements
CA-15	0.15 max.	1.00	1.50	11.5-14	1 max.	Mo 0.5 max.†
CA-40	0.20-0.40	1.00	1.50	11.5-14	1 max.	Mo 0.5 max.†
CB-30	0.30 max.	1.00	1.00	18-22	2 max.	
CC-50	0.50	1.00	1.00	26-30	4 max.	
CE-30	0.30 max.	1.50	2.00	26-30	8-11	
CF-8	0.08 max.	1.50	2.00	18-21	8-11	
CF-20	0.20 max.	1.50	2.00	18-21	8-11	
CF-8M	0.08 max.	1.50	1.50	18-21	9-12	Mo 2.0-3.0
CF-12M	0.12 max.	1.50	1.50	18-21	9-12	Mo 2.0-3.0
CF-8C	0.08 max.	1.50	2.00	18-21	9-12	Cb 8 x C min., 1.0 max.
CF-16F	0.16 max.	1.50	2.00	18-21	9-12	Mo 1.5 max., Se 0.20-0.35
CF-16Fa	0.16 max.	1.50	2.00	18-21	9-12	Mo 0.40-0.80
CG-12	0.12 max.	1.50	2.00	20-23	10-13	
CH-10	0.10 max.	1.50	2.00	22-26	12-15	
CH-20	0.20 max.	1.50	2.00	22-26	12-15	
CK-20	0.20 max.	1.50	2.00	23-27	19-22	

*Phosphorus 0.04 maximum, except CF-16F, which is 0.17 per cent maximum, Sulfur 0.04 maximum, except CF-16Fa, which is 0.20—0.40 per cent. †Molybdenum not intentionally added.

TABLE 2—PRIMARILY HEAT-RESISTANT CASTING COMPOSITIONS

Designation—	Composition, per cent* C	Mn max.	Si	Cr	Ni	Other elements
HC	0.50 max.	1.00	2.00	26-30	4 max.	Mo 0.5 max.†
HD	0.50 max.	1.50	2.00	26-30	4-7	Mo 0.5 max.†
HE	0.20-0.50	2.00	2.00	26-30	8-11	Mo 0.5 max.†
HF	0.20-0.40	2.00	2.00	18-23	8-12	Mo 0.5 max.†
HH	0.20-0.50	2.00	2.00	24-28	11-14	Mo 0.5 max.† N 0.2 max.
HI	0.20-0.50	2.00	2.00	26-30	14-18	Mo 0.5 max.†
HK	0.20-0.60	2.00	3.00	24-28	18-22	Mo 0.5 max.†
HL	0.20-0.60	2.00	3.00	28-32	18-22	Mo 0.5 max.†
HT	0.35-0.75	2.00	2.50	13-17	33-37	Mo 0.5 max.†
HU	0.35-0.75	2.00	2.50	17-21	37-41	Mo 0.5 max.†
HW	0.35-0.75	2.00	2.50	10-14	58-62	Mo 0.5 max.†
HX	0.35-0.75	2.00	2.50	15-19	64-68	Mo 0.5 max.†

*Phosphorus and sulfur 0.04 per cent maximum in all cases. †Molybdenum not intentionally added.

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Among the

Drilling Contractors

Pike Adopts Bonus Plan For Rig Operating Ideas

A plan in which employes are offered rewards for contributing ideas for labor-saving devices and more efficient operation is being carried out by Thomas P. Pike Drilling Co. of Los Angeles. Bonuses ranging from $10 to $100 are given for workable suggestions.

Typical of the numerous suggestions is one recently offered by Wilbanks Vaughan, a catheadman, which was for a metal box-like container to be installed beneath mud screens for trapping and removing sand from the mud as it circulates. The idea, which was put in effect on all the company's rigs won the employe $100 bonus, and has resulted in important savings to the company in minimizing abrasive wear on pumps, drill pipe, valves and fittings.

Practical ideas are shared with other drilling companies.

Drilling Activity Decline Continues in Most Areas

Curtailment of drilling activity in most areas of the United States and western Canada was reflected again during the week ended July 4 by another drop in the number of rotary rigs reported in operation. The decline reduced the number of active rigs to 2,064, 13 below the number reported for the previous week, 90 below the peak of this year during the week ended April 25, and 215 below the number running during the same week a year ago. Only in the Pacific Coast area and in Oklahoma was there an increase in the number of rigs. The recession in activity has been particularly apparent in the Rocky Mountain region and in western Canada, where present productive capacity has greatly exceeded available market outlets.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 7-4-49	Change week ended 6-27-49	Change week ended 7-5-48
Gulf Coast	546	0	— 35
W. Tex.-N. M.	511	— 1	— 51
Ark.-N. La.-E. Tex.	163	— 5	— 5
Oklahoma	235	+ 1	— 61
Kansas	126	— 6	— 3
Illinois-Eastern	118	0	— 11
Rocky Mountains	112	— 5	— 46
Pacific Coast	188	+ 9	— 7
Total U. S.	1,999	— 7	—219
Western Canada	65	— 6	+ 4
Total	2,064	—13	—215

*Courtesy Hughes Tool Co.

Briscoe-Clingman Drilling Co., Oklahoma City, is the contractor on An-Son Petroleum Co.'s Bartlesville sand extension well to the Munger

Daylight crew of Liberty Workover and Drilling Co. about to start a round-trip on a Stanolind Oil & Gas Co. well in the High Island field, Galveston County, Texas Gulf Coast. Left to right: B. L. Anderson, floorman; H. Conway, derrickman; R. Conway, floorman; Hollis Foxworth, driller

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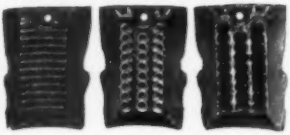

"Varco" buttons, popular for years in rotary drill pipe slips, proved satisfactory and have been adopted and are installed in segments of automatic casing spiders and elevators of various makes. Wickers are removed and holes bored for a maximum number of VARCO casing buttons, to assure uniform and maximum gripping area. Converting buttons for the next smaller casing are available. Write for complete descriptive data.

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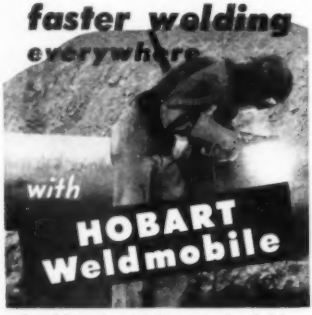

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pool in Oklahoma County. The well, 1 McVickers, C NW NW 7-12n-1w, east of the field, was drilled to 6,055 ft. Casing has been run to the top of the sand at 6,044 ft.

C. E. O'Neal & Co., Evansville, Ind., is the contractor for Ashland Oil & Refining Co. on the latter's 4 Nurrenbern, a McClosky lime test in the Heusler pool, Vanderburgh County, Indiana. Rig is being moved in.

Roy M. Rogers, Clinton, Okla., will drill a 2,500-ft. exploratory test for Intex Oil Co. of Dallas in the C NW SW 35-6n-15e, Pittsburg County. The test, 1 Welsh Unit, is 2 miles west of McAlester.

White & Webb Drilling Co. is the contractor for R. W. Fair on the discovery well of the new pool being opened 5 miles southwest of Cedarvale, Kaufman County, eastern Texas. The well, 1 Wynne, located in the B. S. Newman survey, has been completed flowing 418 bbl. of 32° oil in 21 hours through ¼-in. choke. Production is from the Paluxy (Lower Cretaceous) at 4,965 ft.

Mohawk Drilling Co. has taken a farmout from Amerada Petroleum Co. on a tract located southwest of a lone well at the south end of the Coyle pool in Logan County, Oklahoma. Its first test is 1 Hardiman, located in the NE NE NW 23-17n-1e.

R. C. Patton is the contractor and joint operator with Aladdin Petroleum Co., North American Car Co. and Cooperative Refinery Association on a wildcat test, 1 Kincaid, being started in 15-34-14, 3 miles east of the Aetna gas pool in Barber County.

Joe Bradley, Davis, Okla., is moving in a rotary rig to drill a 2,500-ft. wildcat test for C. L. Carlock on the latter's Hostteter lease in the SW NW SE 27-3n-3e, southeast of the Lewis pool in Garvin County, Oklahoma.

Noble Drilling Co., Tulsa, has the contract for an 8,500-ft. wildcat test to be drilled for the California Co. on the Wade farm in the SE SW NW 23-1n-25w, Harmon County, Oklahoma. Rig is being moved in.

Northern Development Co., Ltd., Calgary, is the contractor for the Redwater Leaseholds, Ltd.-Warner group on a wildcat test being drilled in LSD 2 6-32-14w4th, near the southern tip of Dowling Lake, 100 miles northeast of Calgary, Alta.

Mitchell Bros., Carmi, Ill., have been awarded contract to drill a McClosky lime test for Q. B. Mitchell in the Keensburg Consolidated area, Gibson County, Indiana. Location is on the Phillips farm in the SW NE NE 16-3s-13w. Contract is for 2,800 ft.

General Petroleum, Ltd., Calgary, has been awarded contract for a wildcat test to be drilled for the Midland-Texas Co.-McColl Frontenac Oil Co., Ltd., group in the Stoney Plain area, Alberta Province, Canada. Location is in LSD 7 11-53-1w5th.

Woods Drilling Co., New Orleans, is starting a rank wildcat test for its own account in Barber County, Kansas. It is 1 Schupbach, CNL NW NW 15-34-11, 11 miles southeast of the Boggs pool.

Sterling Drilling Co., Calgary, has been awarded contract for a wildcat test to be drilled for Casgama Oils, Ltd., in the Stettler area, Alberta Province, Canada. The location is 7 miles north and east of Canadian Gulf Oil Co.'s recently completed discovery well.

F-B Drilling Co., Evansville, Ind., will drill Affeld Oil Co. 2-B Oakland City College in the College pool area in the extreme southern part of Posey County, Indiana. The well will be a twin to 2 Oakland City College, drilled by the same contractor. It will be a McClosky lime test to 2,800 ft.

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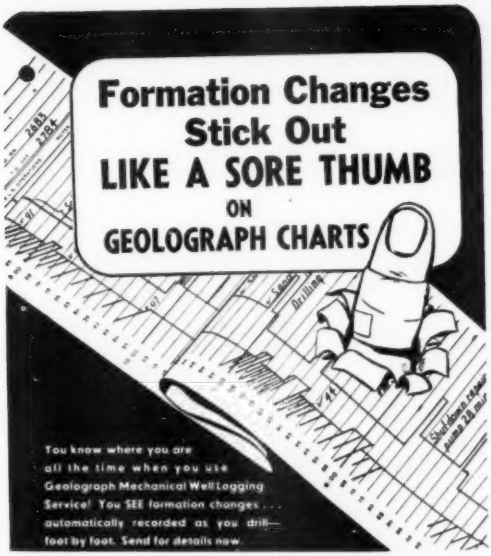
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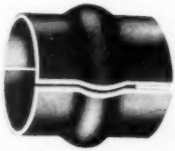

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2 — Absorption Towers, 8' I.D., 34' High (Item 1076S)
1 — Scrubbing Tower, 8' I.D., 23' High (Item 1077S)

TANKS —

2 — Salt Storage & Pump Tanks 12' O.D., 60' Long (Item 8-546)
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2 — Molten Salt Pumps, vertical, Ingersoll-Rand size 32, cap. — 9000 GPM (Item 25)
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2 — 6 x 6 x 18 — Cap. 51 GPM
1 — 12 x 7 x 18 — Cap. 190 GPM
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2 — 6 x 5 x 12 — Cap. 35 GPM
2 — 6 x 4 x 6 — Cap. 15 GPM
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In application on the Atlantic Seaboard Pipeline job in West Virginia, KAPCO ROCK SHIELD, newly developed protective shield for pipe and pipe coating, has been subjected to strenuous tests and has been found to be more than adequate in giving maximum protection against damage from rock in terrain where dirt padding was impractical.

Easy to apply, KAPCO ROCK SHIELD is a mastic board manufactured in sheets 8' long and in 1/8", 3/16" and 1/4" thicknesses. Sheets are scored lengthwise for ease in forming around the pipe. On pipe diameters of 14" or greater, two sheets are required for complete encirclement of the pipe allowing an overlap on each side. Midwestern has standardized a simple method of securing KAPCO ROCK SHIELD to the pipe by using a high tensile strength fiber strapping (steel strapping also available) and a small ratchet strapping tool.

In a series of penetration tests conducted by engineers in the field, dense limestone rocks—ranging in size from 6-in. x 12-in. x 2.5-in. to 17-in. x 8-in. x 4-in.—were dropped 5 ft. to hit pipe protected by 3/16" ROCK SHIELD, and with both flat and cutting edges striking the Shield. *Even though some of these penetrated the Rock Shield, inspection by electronic detector showed that there were no holidays in the coating.*

ROCK SHIELD eliminates cost of padding the ditch.

ROCK SHIELD is ideal for protecting pipe at river or road crossings where coating is subject to damage in pipe handling; also used for padding under river weights and pipe anchors.

ROCK SHIELD available for early delivery, in complete Midwestern package including strapping, ratchet strapping tool and aluminum seals.

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PIPE LINES

Basin and Ozark Systems Dedicated at Cushing

The Basin and Ozark Pipe Line systems, together comprising the largest crude-oil pipe line ever built by private capital in America, were formally dedicated on July 12 at Cushing, Okla.

Walter S. Hallanan, president of the National Petroleum Council, was the principal speaker.

Stretching approximately 1,000 miles from Jal, N. M., via Cushing to Wood River and Patoka, Ill., the completed lines provide transportation for crude oil from West Texas and New Mexico to the refining centers of the Midwest.

The 515-mile Basin pipe-line system, including pipe of 20, 22, and 24-in. diameter from Jal to Cushing, will have a capacity of 241,000 bbl. of crude oil daily. The 435-mile 22-in. Ozark system which connects with the Basin line at Cushing and continues on to Wood River and Patoka, will handle 186,000 bbl. daily.

The two new systems are projects of four companies, financed by themselves without subsidies of any kind. The Basin system, built by Texas Pipe Line Co., is owned and will be operated on an undivided-interest basis by Texas Pipe Line, together with Shell Pipe Line Corp., Sinclair Refining Co. and Empire Pipeline Co. The Ozark system, built by Shell Pipe Line Corp., is jointly owned by Shell and Texas Pipe Line Co., while the 54-mile extension to Patoka is owned by Texas Pipe Line. At Cushing and Patoka the system will connect with lines of other companies.

The lines were planned in early 1947; field-construction work on the Basin system was started in November 1947, and on the Ozark system in December 1948. The Basin line has eight main-line pump stations, and the Ozark line has five. All embody the latest design with electrical motor-driven centrifugal pumps and automatic controls.

In connection with the opening of the two systems there was an extensive tour of stations, a barbecue, and dedication ceremonies at Cushing, and a dinner in Tulsa.

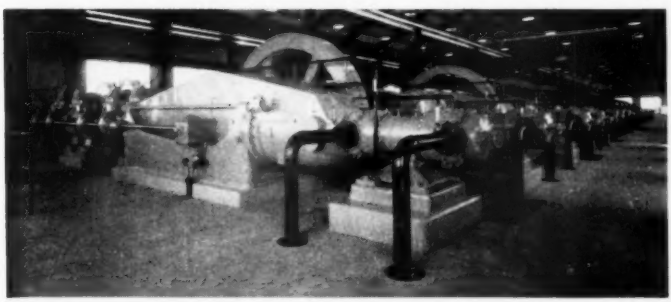
Imperial Lays 56 Miles For Alberta Pipe Line

Imperial Pipe Line Co., Ltd., is laying 56 miles of 3, 4, 6, and 8-in. crude-oil lines in Alberta including 32 miles in the Redwater area and 24 miles in the Leduc and Woodbend areas. These projects have been contracted by Sparling-Davis Co., Ltd., Dokken Pipe Line Construction, Ltd., and New West Construction Co., Ltd., for completion October 31, 1949.

P. G. & E. Starts 34-In. California Gas Line

SAN FRANCISCO.—Ditching operations for the largest pipe line ever built for high-pressure transmission of natural gas began June 29 near Llanada, Calif., in the Panoche Hills, 33 miles south of Hollister. The biggest wheel-type trencher ever used is being utilized to dig a ditch 44 in. wide and 5½ ft. deep.

The new line is the "Super Inch" 34-in. pipe line of the Pacific Gas & Electric Co. from Needles to Milpitas just south of San Francisco, a distance of 506 miles. The line will connect at Needles with the system of



Compressor station of Cities Service Gas Co. at Ulysses, Kans., at the western end of the 26-in. pipe line being completed this year for the transmission of natural gas from the Hugoton area to Kansas City

Every step of laying a pipeline is a specialized engineering procedure—when Oklahoma Contracting is on the job. Ample, specialized equipment in the hands of seasoned personnel, plus world-wide scope of operations, make it a "must" to call in OK when figuring any oil, gas, or gasoline pipelining job!

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PROTECT YOUR PIPE LINE with Williamson Pipe Line CASING INSULATORS*

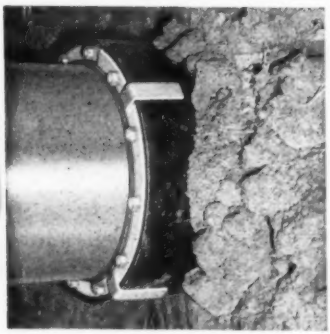
This device—simple, rugged, economical—supports and guides the leading end of coated line pipe into the right-of-way casing under railroads and highways.

Additional Casing insulators, clamped around the pipe every 20 to 30 feet, serve three purposes:

1—To protect the pipe coating.
2—To act as pipe skids, facilitating installation.
3—To separate pipe and casing, assuring permanent insulation for cathodic protection.

•

WmSEAL CASING BUSHINGS*



Equipped with exclusive T-gasket for positive water-tight seal and insulation of pipe from steel flanges, this improved "casing seal" is designed for easy installation at each end of pipe-line casing under right-of-way crossings.

WmSEAL Casing bushings are readily installed because they offer:

- Large center hole for loose fit around coated pipe.
- Generous clearance inside of casing before bolts are tightened.
- Easily opened after removal of only one bolt, for closing around installed pipe line. WmSEAL Casing Bushings are widely used as wall sleeves for valve boxes, manifolds, etc.

*Patents Pending

El Paso Natural Gas Co. for bringing natural gas 1,600 miles from fields in Texas and New Mexico to northern California.

The Llanada-Milpitas 80-mile section will be used as a temporary underground-storage facility for gas until the rest of the line is ready for service.

The entire line will cost P. G. & E. and El Paso Natural Gas Co. approximately $150,000,000. The El Paso company will build from the fields to Needles; P. G. & E. will build from Needles to Milpitas.

First deliveries of 150,000,000 cu. ft. of gas per day are scheduled to begin January 1, 1951. In 1952 it is planned that deliveries will be increased to 300,000,000 cu. ft. per day with other increases planned for later dates. It may be mentioned that 300,000,000 cu. ft. a day is more than half the total present average load carried by Pacific Gas & Electric Co.

H. C. Price Spread Serves In W. Va. Flood Emergency

The value of a pipe-line spread for serving a community during an emergency was demonstrated by H. C. Price Co. when a flash flood recently hit Petersburg, W. Va., in the vicinity of construction operations for laying 26-in. pipe for the line to the Baltimore, Md., area now being built for Atlantic Seaboard Corp. and Virginia Gas Transmission Corp.

The Price spread under Charles Ice, superintendent, went to the rescue of Petersburg when a 24-in. deluge isolated it for 36 hours. All power was off and communication was severed. All roads were washed out. The spread's mobile power units furnished current at the most essential points and its radio facilities established communication with the outside. Highways were made passable for transportation of food and water by the work of the spread's bulldozers.

Ark.-Okla. Gas Lays Spiro, Okla., Pipe Line

Arkansas Oklahoma Gas Co. is laying 14 miles of 12-in. for transmitting gas from the Spiro, Okla., field to a connection with the company's system serving Fort Smith, Ark.

The work has been contracted by A. C. Holder Construction Co.

Pipe-Line Outlets for West Texas Oil Planned

A pipe-line outlet is to be provided for three oil-producing fields on the east side of the West Texas basin. The new line will be built under a

Two joints of 30" pipe welded together to form a length 62' long, shown in the final Bending Stage in the "Cinch" Bender. Note how the pipe was bent continuously through the Welded Joint. This demonstration established firmly, quality on an Economical Basis.

Makes Bending a Cinch

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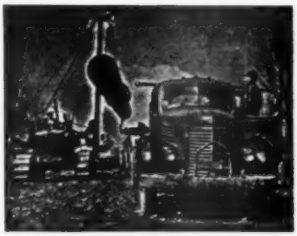

1,463 Miles of Pipe in 1948

Parkhill is now stringing 480 miles of 22" pipe for Shell Oil Company's Cushing, Okla. to Wood River, Ill. pipe line. Parkhill has the facilities to string any size pipe over any type terrain. Let Parkhill expedite the construction of your next line and add you to their long list of satisfied customers.

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Assures an adequate supply of cool, pure drinking water for workers *everywhere*—in factory or field. Protects their health, and keeps them on the job. Fountain has inner water container of stainless steel. Four gallon tank is fully insulated. Constant air pressure for instant flow of water is furnished by a few strokes of the pump at widely spaced intervals. *Operates at the press of a button*, like any bubbler drinking fountain. May be easily carried from place to place by shoulder strap, or mounted on truck, tractor or locomotive.

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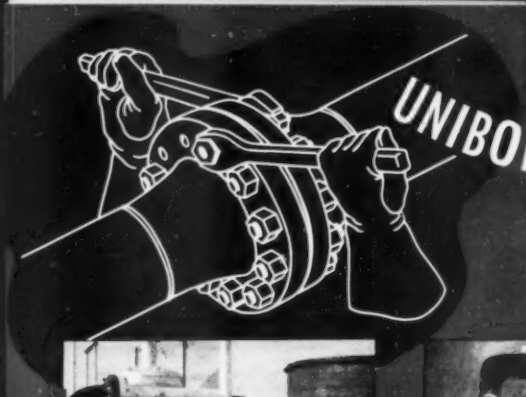

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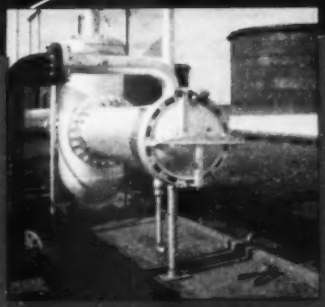
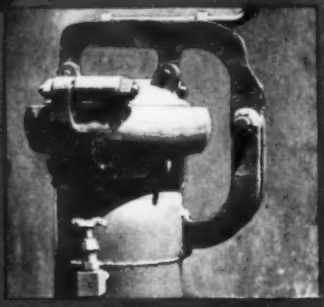
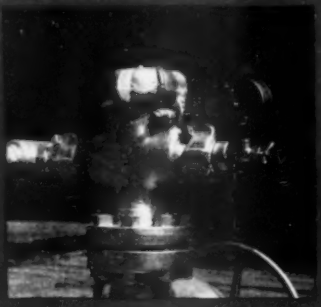


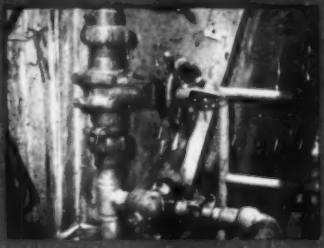
28-Inch Hinged UNIBOLT Scraper Trap



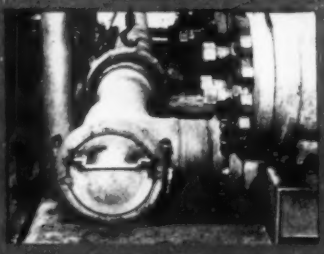
Hinged UNIBOLT Gas Pipeline Blow-Down



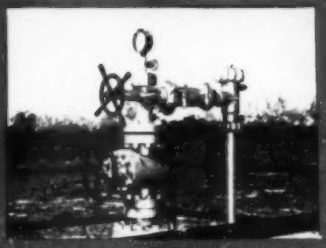
UNIBOLT Christmas Tree Cross with Blanking Plugs Tapped for Pressure Gauge



Mud Line Valves Equipped with UNIBOLT Couplings



UNIBOLT Slush Pump Strainer



UNIBOLT Flow Manifold

On any pipe connection . . . in any oil industry service . . . where flanged unions or closures are now employed, *UNIBOLT provides a better way to do the job.*

UNIBOLT provides a safer, stronger, joint because the unique UNIBOLT design places more metal in shear.

UNIBOLT provides a light-weight, less bulky unit which is economical, completely salvageable and interchangeable.

UNIBOLT provides a more convenient connection or closure because of its time-saving design, and blanking plugs which are available with a hinge to facilitate opening and closing.

UNIBOLT couplings are easily installed in hard-to-get-to places.

A few typical applications of UNIBOLT Couplings are presented herewith. See your Composite Catalog for complete mechanical details and other recommended UNIBOLT services.

THORNHILL-CRAVER CO.

HOUSTON UNIBOLT **TEXAS**

program authorized by Texas-New Mexico Pipeline Co.

The plans call for construction of a 40-mile, 10-in. trunk carrier from the Basin Pipeline System's Colorado pump station in Southeast Scurry County westward to Southwest Borden County. The line will feed into Basin's 22-in. common carrier extending into the Middle West.

From the pipe-line terminal in Borden the system will spread out in three directions: 6 miles of 6-in. will be laid south to tap the Vealmoor field on the Howard-Borden county line; 6 miles of 6-in. will extend west to tap the Good field; and 17 miles of 6-in. will be laid northwest to connect Sinclair Oil & Gas Co.'s discovery area on the Williams Ranch.

All fields to be tapped by the proposed line are being served by tank trucks.

Colorado station on the Basin system also is the tie-in point for Pasotex Pipeline Co.'s 22-mile, 6-in. line from North Snyder field in Scurry County.

Southwestern Independent Buys 108-Mile Gas Line

Southwestern Independent Gas Pipe Line Co., Houston, has recently purchased from War Assets Administration a 108-mile line for $279,000 cash. This line was the southern end of the Southwest Emergency Pipe-Line System which was organized during World War II to deliver crude oil from the Corpus Christi area to Houston pipe-line connections. The Southwest Emergency system largely comprised natural-gas pipe-line facilities which were reconditioned for conversion to crude oil service.

Previously Southwestern Independent purchased the northern section of the line. The company has been operating the 108-mile southern section on a lease basis.

Kerr-McGee Completes Panhandle Gas System

Kerr-McGee Oil Industries, Inc., has just completed an 18-mile natural-gas system in Sherman and Moore counties of the Texas Panhandle for delivering gas to the Phillips Chemical Co. plant at Eter, Tex., which is using 20,000,000 cu. ft. daily.

Part of the system is taking gas from the wells of Humble Oil & Refining Co.

Salt Lake Products Line To End at Pasco, Wash.

The 560-mile products line to be built by Salt Lake Pipe Line Co. will transport from Salt Lake City to Pasco, Wash. Pasco is located at the junction of the Snake and Columbia rivers; rail transportation facilities at Pasco would facilitate deliveries to northwestern Washington points.

The taking of bids, diameters, route, cost estimates and other matters connected with the project were discussed on page 102, July 7 issue of The Oil and Gas Journal.

Kansas-Nebraska Natural Seeks to Enlarge System

Hearings will begin July 20 in Washington, D. C., on application of Kansas-Nebraska Natural Gas Co., Inc., for authorization to construct additional natural-gas facilities which would increase delivery capacity of the company's system to 140,000,000 cu. ft. of gas daily.

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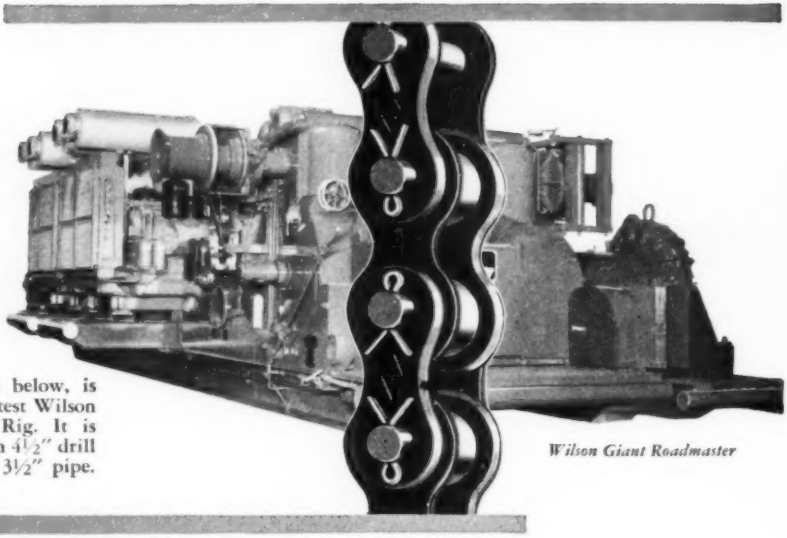
On The Latest Wilson Rig



Wilson Giant Roadmaster

Bobby Burns of Wichita Falls, son of Lester T. Burns, the purchaser of the 1932 Model Wilson Rig shown below, is the owner of this latest Wilson Giant Roadmaster Rig. It is rated at 7500 ft. with 4½" drill pipe; 9000 ft. with 3½" pipe.

. . . As On This 1932 Model

This 1932 model, the second Wilson Drilling Rig built, owned by L. T. Burns.

As Mr. Aubrey A. Wilson writes, "Needless to say Diamond Roller Chains were used on the first Wilsons and are regularly used on the New Giant Roadmasters as well."

TRADE ◇ MARK

Now as Then . . . Equipped with . . .

DIAMOND ROLLER CHAINS

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Exploration and Drilling

Tertiary in Rocky Mt. Area Drawing Interest

ROCKY MOUNTAIN operators and geologists are taking more interest in production possibilities of the Tertiary after Carter Oil Co.-Stanolind Oil & Gas Co. 1 Ute Tribal, NW SW 21-1s-1e, Uintah County, Utah, was completed for 68 bbl. per hour on a 24-hour test, making brown, paraffin-base oil of 31° gravity, from pay at 9,351-92 ft.

That probably accounts for the amount of interest shown in reports that Pure Oil Co. 1 Badwater Unit, SE NE NW 35-39n-89w, Natrona County, Wyoming, had had some shows of oil in the Tertiary at shallow depths. After samples indicated a fair show of live oil, with good odor, a drill-stem test was attempted at 1,914-60 ft., but the packer failed after the tool was open only 5 minutes. The recovery was 100 ft. of drilling mud with no shows.

Another show was reported at somewhere above 2,236 ft., and a core at 2,236-51 ft. is said to have shown live oil in the top foot. No drill-stem test was made. Scattered shows and staining have been reported from 2,236 to 2,980 ft., last reported drilling depth.

The Pure test is said to be a projected 12,000-13,000-ft. test to try for Cretaceous production. It is in the Wind River basin, about 45 miles northwest of Pure's West Poison Spider discovery, where the world's depth record for production was held for a time by the Frontier sand at 14,307 ft. The Badwater Unit is said to lie in approximately the same relative position with respect to the basin that West Poison Spider lies, so that it may be said to lie along the strike trend.

The Badwater test and block are reasonably close to Sinclair's deep Lysite test, which was suspended around 13,000 ft. about 2 years ago, still in the Mesaverde, which lies near the top of the Upper Cretaceous. At West Poison Spider, the Mesaverde comes in around 6,000 ft.

Some reports on the Tertiary shows in the Badwater test are to the effect that no good solid sand body has been encountered to afford a reservoir for the oil, of which signs are so frequent. In good Tertiary producing territory, signs such as those in the Badwater test would start a study of the stratigraphy, with the idea of finding an area where the facies had shifted to a more sandy phase.

The trouble with this idea in the Rocky Mountain area, and especially in the Wind River basin, is that too little is known about Tertiary stratigraphy. On the rims of the basins, where most of the drilling has been done, Tertiary is usually either gone completely, or is present in only a thin section. So far, as drilling has progressed toward the centers of basins, little attention has been given Tertiary possibilities. This was simply on the basis that no important Tertiary production had been found in the Rocky Mountain area.

The result of the Uintah basin discovery of Carter-Stanolind, and the shows reported in the Badwater Unit will undoubtedly have their effect. There are plenty of places in the region where a thick Tertiary section of 6,000 ft. and more overlies the Cretaceous and Paleozoic oil-producing formations that have been the main objective so far.

If the Tertiary should develop some highly promising oil-producing formations, it might make considerable difference. Even before very deep tests below the Tertiary, well out in the basins, were drilled, shallower Tertiary fields might be developed. Furthermore, the prospects of getting a sweet crude are important in this area where there is so much black, low-gravity, high-sulfur crude already. *Charles J. Deegan.*

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST CENTRAL TEXAS.—Skelly Oil Co. released drill-stem and core data on its 1 E. A. Ater, 67-23-T&P, Ellenburger prospect 3½ miles southwest of Rosco in Nolan County. The drill-stem tests were: 7,087-97 ft., open 4 hours, recovered 4,850 ft. of gas, 28 ft. of oil, and 92 ft. of oil-cut mud, flowing pressure 215 psi., bottom-hole pressure 2,910 psi.; 7,089-7,105 ft., 4 hours, gas came to the top in 17 minutes, recovered 6,225 ft. of 43.3°-gravity oil, plus 160 ft. of oil and gas-cut mud, flowing pressure was 2,255 psi.; 7,090-7,115 ft., open 7 hours, gas in 50 minutes, recovery 5,790 ft. of oil and mud-cut oil, flowing pressure 2,085 ft., bottom-hole shut-in pressure 2,175 psi.; 7,108½-20 ft., open 6 hours, gas in 62 minutes, recovered 540 ft. of oil, 120 ft. of oil and gas-cut mud, flowing pressure 265 psi., bottom-hole pressure 2,620 psi.

NORTH TEXAS.—The new Ellenburger distillate field 4 miles southwest of Cottondale in Wise County received a new pay discovery at Signal Oil & Gas Co. 2 Jack Daly, Section 48, J. F. William Survey, when it flowed 116 bbl. of 37°-gravity oil a day from the Caddo at 3,840-85 ft.

WEST TEXAS.—Union Oil Co. 2-H Cowden, 14-A55 PSL, on the south end of Dollar Hide field of Andrews County, and a west offset to an 8,560-ft. dry hole drilled by Humble 2 years ago, kicked off after swabbing and flowed at the rate of 198 bbl. of oil daily through ½-in. choke, from the Devonian at 8,270-8,315 ft. On the north side of Beddo field, Runnels County, Chapman & McFarlin 1 W. B. Dankworth flowed 176 bbl. of oil in 6 hours, with cable tools still in the hole, from what is believed to be the Jennings lime (Strawn), at 3,722-41 ft. Operators called it the fourth pay discovery for the field.

ROCKY MOUNTAIN AREA.—Superior is still testing at the world's deepest well, located in southwestern Wyoming. British-American Oil Producing Co. is completing a new discovery in southern Montana, at Clark Fork, as a small gas-condensate well.

Scientifically made and precision threaded } to do a real job

"Oilwell" Bull Plugs and Swaged Nipples

ALTHOUGH the selection of sizes, weights and threads available in "Oilwell" Bull Plugs and Swaged Nipples is extremely wide, quality is confined to one high standard.

Threading is a precision job. Accurate, clean, uniform threads are of full size and length in accordance with A.P.I. standards. Ends are faced square . . . beveled on the outside for easy starting . . . chamfered on the inside to remove sharp edges. Bodies are electrogalvanized to protect against rust. Threads are lubricated for easier installation.

Bull Plugs, two inches and smaller, and Swaged Nipples, one-and-one-half inches and smaller, are machined from solid bar stock. Larger sizes are all made from new seamless steel pipe by modern forging methods and equipment, assuring full strength throughout.

Select the sizes, weights and threads you want at your nearest "Oilwell" store—or order through any "Oilwell" office.

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USS "OILWELL"

UNITED STATES STEEL

SOUTHWEST TEXAS

New Pay Zone Found In West Corpus Field

CORPUS CHRISTI.—The Chicago Corp. 2 J. C. Wilson has indicated oil production in a new pay zone for West Corpus field, Nueces County. A 25-minute drill-stem test made at 8,342-50 ft. recovered 1,660 ft. of pipe-line oil through ¼-in. choke, and developed 35 psi. working pressure, 1,875 psi. flowing pressure, and 3,675 psi. shut in.

Producers Development Co. 1 Veronica McCullough, wildcat, in Nueces County, 1 mile south of Richard King field, tested gas with a spray of oil on initial test. Total depth of the well is 7,000 ft., and perforations were made at 5,538-46 ft. for the test, after setting casing through the section.

Magnolia Petroleum Co. 1 Mary E. Miller, north extension test to Edinburg gas-condensate field, Hidalgo County, has been completed as a gas-condensate producer. Total depth of the well is 8,462 ft., with 9⅝-in. casing on bottom, and is producing through perforations at 7,639-67 ft. through 11 32-in. choke with 1,900 psi. working pressure.

Humble Oil & Refining Co. 1 R. J. Kleberg, Jr., wildcat, in the East Encino area of Brooks County, developed 1,650 psi. working pressure through ¼-in. choke when the blowout preventor was closed on a blowout attempt at total depth of 10,146 ft. Several shows of interest have been tested below the 8,100-ft. level. Operators have set a 9⅝-in. protection string to 7,989 ft.

Humble Oil & Refining Co. has staked location for a 10,300-ft. wildcat test in Hidalgo County, approximately 4 miles south of Santa Fe field. The new test is 5 Santa Fe ranch, in San Salvador del Tule grant, 11 miles south of Encino.

The 38 new locations in Southwest Texas included 12 wildcat starts, 1 each in Bandera, Dimmit, Williamson, Aransas, Brooks, Duval, Jim Hogg, Kenedy, Nueces, and Zapata counties, and 2 in Frio County. There were 15 exploratory tests completed, of which 5 were produces, 1 each in Nueces and San Patricio counties, and 3 in Duval County.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCATS

Duval County: New gas pool—Edwin B. Cox & Jake L. Hamon & Geo. H. Coates 1 A. Lopez, in AB&M Sur. 731-A-765, 2 mi. W of North Kohler field, top sand 2,289 ft., TD 2,918 ft., perf. 2,289-93 ft., IP: 1,200 M.c.f. gas per day on open flow, SIP 350 psi.

New oil pool, at East Realitos, 1½ mi. SW of So. Longhorn field, Santos Garcia grant, dual completion, top pay 4,179 ft., TD 5,605 ft., perf. 4,253-56 ft. and 4,179-84 ft., IP: 62 bbl. oil per day through 9/64-in. choke, GOR 650, TP 210 psi., casing sealed, grav. 46.1°.

New pay, at Hoffman, Bridwell Oil Co. & J. W. Gorman 1 Juan Flores et al, G. Mirales Sur. 118, A-1169, just NE of Hoffman field, top pay 1,938 ft., TD 2,705 ft., perf. 1,938-48 ft., IP: 1,500 M.c.f. gas per day on open flow, SIP 700 psi.

Nueces County: New pay at Calallen, in M. Lopez de Herrera grant, 2 mi. W of Calallen & 2 mi. E of Riverside field, top sand 7,245 ft., TD 7,800 ft., perf. 7,246-49 ft., IP: 104 bbl. oil per day through 7/64-in. choke, GOR 945, TP 1,050 psi., CP 1,450 psi., gravity 37.5°.

San Patricio County: New discovery—Quintana Petroleum Corp. 1 J. H. Harvey, in Geo. Sargent Sur., 3½ mi. N of Gregory, top sand 9,978 ft., TD 13,950 ft., perf. 9,978-84 ft., gas well, no gage, SIP 5,250 psi.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Bexar County: Eckert & Son 1 E. H. Yturria et al, in A. Stafford Sur. 49, 10 mi. SE of San Antonio, dry, TD 1,102 ft.

LaSalle County: Kirkwood & Co. 1 M. G. Jeffries, in HE&WT Sur. 743, A-871, 7 mi. E of Steward, dry, TD 5,252 ft.

Starr County: J. W. Gorman et al 1 Manuel Hinojosa, in J. Salvador Porcion 109, 24 mi. NNW of Rio Grande City, dry, TD 3,020 ft.

H. E. Smith 1 Francisco Salinas, in Porcion 109, 20 mi. NE of Roma, J. S. Garcia hrs. Sur., A-97, dry, TD 2,006 ft.

Webb County: Dulaney Oil Co. 3 Lod Moglia Est., in Sur. 670, 1½ mi. N of West Cole field, dry, TD 2,450 ft.

Gordon W. Johnson A-1 Dan Adami, in Sur. 3, "A" lease, 4 mi. S of Adami field, dry, TD 1,613 ft.

O. W. Killam 3 Bruni Est., C&M RR Sur. 449, 4 mi. S of Bruni, dry, TD 1,818 ft.

O. W. Killam 1 Marrs McLean, in James subdivision, Albercas grant, 7 mi. SW of Bruni, 1 mi. W of Quien Sabe field, dry, TD 2,530 ft.

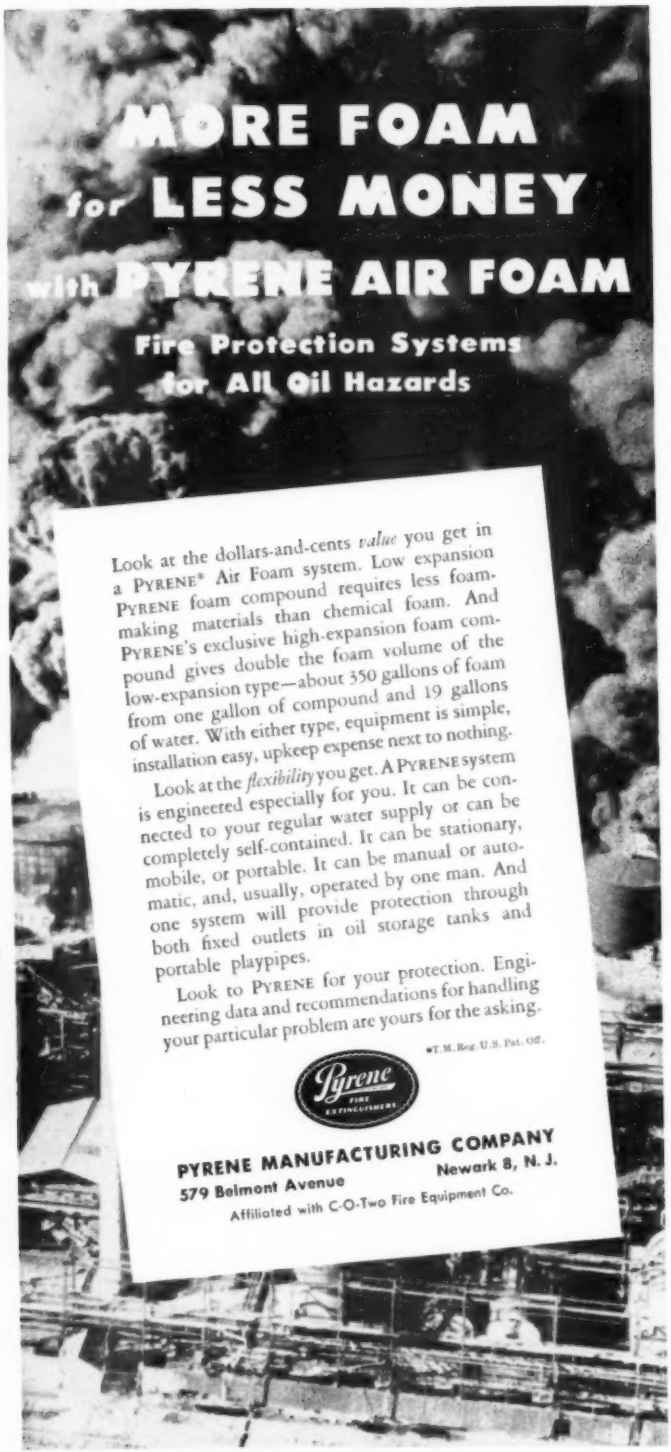
Willacy County: J. C. Wynne 1 Stone Est., in San Juan de Carricitos grant, 5 mi. SE of Raymondville, dry, TD 7,521 ft.

Zapata County: F. P. Schwab et al, 1 Maryland Trust Co., in Sur. 314, cert. 289, 6 mi. W of Randado, dry, TD 2,009 ft.

APPALACHIAN FIELD

Preston County Wildcat Drills Below Gas Sand

PITTSBURGH.—In Portland district, Preston County, West Virginia, Nollem Oil & Gas Co.-Snee & Eberly's wildcat, 1 Hugh R. & James A. Fitzpatrick, elevation 2,228 ft., reported the Oriskany sand at 5,652 ft. with gas gaging 225,000 cu. ft., and is drilling at 5,686 ft. In Reno district, Snee &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Eberly 1 Dola E. Dever is drilling at 2,864 ft. In Glade district, Webster County, Hope Natural Gas Co. 9227 West Virginia & Pittsburgh Railroad Co. has encountered a fishing job at a depth of 7,086 ft. Three other deep tests have reached the Corniferous lime formation; in Grant district, Ritchie County, Davis-Kelly Oil Co. 1 Morello Jackson at 5,322 ft., elevation 633 ft.; in Steele district, Wood County, Columbian Carbon Co. 1124 C. W. Moore at 4,750 ft., elevation 772 ft.; in Pocatalico district, Putnam County, Columbian 1121 L. A. Landers at 4,830 ft., elevation 835 ft. In Dry Fork district, Tucker County, Cumberland & Allegheny Gas Co. 1-A-425 Jason Harman is at a depth of 375 ft. Two good shallow sand gas wells were reported: in Clear Fork district, Raleigh County, United Fuel Gas 2-6536 J. A. Barrett, 1,008,000 cu. ft. in Weir sand, total depth 2,389 ft.; in Baileysville district, Wyoming County, United Producing Co. 1-1617 Glen Williams, 2,100,000 cu. ft. in the Berea sand, total depth 3,470 ft.

In Wharton Township, Fayette County, southwest Pennsylvania, William E. Snee et al 3 Indian Creek Coal & Coke Co. is shut down at a depth of 763 ft.

CANADIAN FIELDS

Good Show Near Stettler Holds Alberta Interest

CALGARY.—Oil encouragement was obtained in a drill-stem test of Lower Cretaceous sand at the 1 Casagama wildcat, located in LSD 5, 7-30-19w4, 1 mile northwest of Stettler town and 100 miles northeast of Calgary. A drill-stem test was run of an 18-ft. Lower Cretaceous sand interval below 4,000 ft. The 1-hour test gave a small gas flow (around 50,000 cu. ft. daily), plus a pipe recovery of 225 ft. of crude oil. Coring and testing is continuing. The Casagama venture, being drilled by a private company sponsored by Windsor and Detroit businessmen, obtained a natural gas flow of 500,000 cu. ft. daily in the Viking sand horizon about a week ago.

Pincher Creek.— Canadian Gulf Oil Co. has plugged back in the Madison limestone from bottom 12,768 ft. to 12,473 ft. at its second Pincher Creek deep exploratory completion, in an effort to shut off formation water which has shown along with gas and light oil. The well, 1 Gulf-Walter Marr, in LSD 1, 29-4-29w4, is around 7 miles northwest of 1 Gulf-Pincher Creek which completed 20 months ago as an important discovery of wet gas. The Marr well is presumed to be on a separate structural feature.

The 1 Marr topped its Madison limestone objective at 12,185 ft., and completed at 12,768 ft. After casing to top of the limestone, extended production tests were run in mid-June of the full Madison lime section, which contained about 400 ft. of varying porosity and fracturing. As a result of those tests, the hole was cemented back to the 12,473-ft. level. Further flow tests will commence within the next few days.

The distillate recovered showed approximately a gravity of 52.7° A.P.I. during tests. The water is mildly salty and highly sulphurous. During last 6½-hour test run through a 1-in. choke, recovery consisted of 47.38 bbl. distillate, and 17.61 bbl. water. Daily gas flow during test period was recorded between 8,430,000 and 9,300,000 cu. ft.

It has not been definitely decided whether the water is formation water or residue from drilling fluid, though it appears probable it is at least in part formation water from near bottom of the hole. The plugging back may effect a shutoff, and permit evaluation of the well as a gas-distillate producer.

Leduc.—A team of three Alberta independent oil companies has obtained oil success at its second Leduc venture on the far west side of the field, and will likely spud its third test in the next day or two.

The new oil well, 2 Flank-Leduc, LSD 11, 18-50-26w4, ¼ mile south of the initial success, completed in D2 Devonian at 5,168 ft. and set 7-in. casing at 5,090 ft. The well was swabbed into production, and during first hour flow test, it produced 60 bbl., a daily rate of 1,920 bbl. Contractor General Petroleums, Ltd., is rigging up at 3 Flank-Leduc, in LSD 13, 18-50-26w4, ¼ mile west offset of No. 1 oil well.

Redwater.—1 Imperial-Lily, wildcat in the Redwater region, located in LSD 7, 12-58-23w4, about 2 miles west and slightly north of production, found water in the Devonian interval 3,023-48 ft. During 45-minute drillstem test the well yielded 1,900 ft. of salt water. Coring is now proceeding at 3,126 ft.

Wildcat abandonment.—2 Pacific-Sunray, LSD 9, 35-59-23w4, TD 3,789 ft.

CALIFORNIA

Activity Continues In Carrizo Plains

LOS ANGELES.—Although no encouraging oil showings have been encountered as yet in the Carrizo Plains area, testing continues. Union Oil Co., in collaboration with Richfield Oil Corp., has drilled three dry wells on its Wreden Ranch holdings. Two more tests, 4 and 5 Wreden, are now under way and plans have been announced for the sixth venture.

In the same area, Independent Exploration Co., along with Universal Consolidated Oil Co. and Gene Reid, has set location for a test in 36-28s-18e. This will be the team's 53-36 Producers. The same group's 67-36 Temblor-Rexroth, being drilled in the same block, is now coring at 3,350 ft. Early reports of oil showings in this well have not been borne out. Heavier equipment will be moved in.

The Texas Co. has abandoned 1 Grayson-Owen, 14-31s-18e, Carrizo Plains wildcat, at 2,160 ft.

General Petroleum Corp. brought in a new De Sota well at Long Beach. Its 2 Barnesbush flowed 400 bbl. of oil per day from the interval between 9,860-10,150 ft., total depth.

Tide Water Associated Oil Co. 27 McGonigle was completed at 13,706 ft. in Ventura Avenue field. The well came in flowing at the rate of 657 bbl. of 26.9°-gravity oil per day with 515,000 cu. ft. of gas. Tubing pressure was 1,000 psi.

A test in a new section of the Tejon area will be made by Standard Oil Co. of California. It has taken over 1,280 acres from Petrol Corp. The acreage lies in the blocks east and north of present Comanche Point production.

Humble Oil & Refining Co.'s extension try at Polama field has passed the 10,250-ft. mark. The top of the Polama zone is expected to be reached around 10,500 ft.

Four new producing wells were completed in South Cuyama field. Richfield accounted for three: 22-36 Hibberd, 1,246 bbl. per day; 88-26 Machader, 1,200 bbl. per day; 17-31 Perkins, 4,400 bbl. per day. Superior brought in the fourth well, 17-25 Heath, for 700 bbl. per day. These wells will be put on a production schedule of around 250 bbl. per day.

Michael Kadlec 1 Kosanke, 14-11n-28w, northwest of Russell Ranch production, was abandoned at 2,500 ft. Richfield's 2 Harrington U.S., in the same section, is standing idle at 2,265 ft. In 24-11n-28w, Southern California Petroleum Corp. 2 Joice is cleaning at 2,790 ft.

Standard of California 45 Van Sicklen, a deep test in the Lost Hills area of Kern County, has reached 14,596 ft. At present the well is testing water shutoff at 13,353 ft. Randan Petroleum Corp. also has a test in this area. However, its well, 2 Theta, is a test of shallow zones.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Antelope Hills area: Independent Exploration Co. 83 Bolton, 27-27s-19e, 2,022,000 cu. ft. of gas, 16-hr. test, 17/64-in. bean, 1,210 psi., 1 bbl. condensate in 24 hours, TD 4,313 ft.

Monterey County, Monroe Swell area: The Texas Co. 1 Beedy, 19-19s-7e, 150 bbl. of 14°-gravity oil per day, TD 3,000 ft., elev. 946 ft.

Yolo County, Pleasant Creek area: Shell Oil Co., Inc. 4-1 unit, 8-8n-1w, perforated 2,712-50 ft., 9,900,000 cu. ft. of gas, TP 1,259 psi., TD 2,859 ft., elev. 255 ft.

CALIFORNIA WILDCAT FAILURES

Fresno County, Cantua Creek area: Humble Oil & Refining Co. 1 S. P., 25-18s-16e, dry, TD 11,415 ft., elev. 328 ft.

Monocline Ridge area: Western Gulf Oil Co. 84-4 Lillis, 4-17s-14e, dry, TD 5,469 ft., redrilled 3,400-5,005 ft., elev. 761 ft.

Kern County, Devil's Den area: Honolulu Oil Corp. 21 Alferitz, 14-25s-18e, dry, top Escudo 1,603 ft., Media 1,650 ft., Carneros 1,744 ft., Santos 1,903 ft., Kreyenhagen 1,943 ft., Point of Rocks 1,982 ft., TD 2,242 ft., elev. 653 ft.

Tejon Hills area: R. B. Jackson 1 Kosanke, 14-11n-18w, dry, top Santa Margarita 860 ft., TD 954 ft., elev. 1,155 ft.

Morton & Sons 1 Macoil, 4-11n-18w, dry, top Santa Margarita 805 ft., TD 1,451 ft., elev. 1,028 ft.

F. A. Miller 28-11 Miller-Tejon, 11-10n-19w, dry, TD 2,428 ft., elev. 1,010 ft.

Mojave area: Western Reserve Research Lab., Inc., A-1 Crookshank, 13-30s-37e, dry, TD 1,950 ft., elev. 2,234 ft.

Monterey County, San Ado area: Jergins Oil Co. 1 North (USL), dry, top Santa Margarita 1,505 ft., Lombardi 1,985 ft., Continental red beds 2,180 ft., granite 2,288 ft., formation test 1,505-70 ft. failed, TD 2,332 ft., elev. 1,245 ft.

San Luis Obispo County, Elkhorn area: Frank R. Short 2 Melinda, 22-32s-22e, dry, formation test 1,580-1,630 ft. recov-

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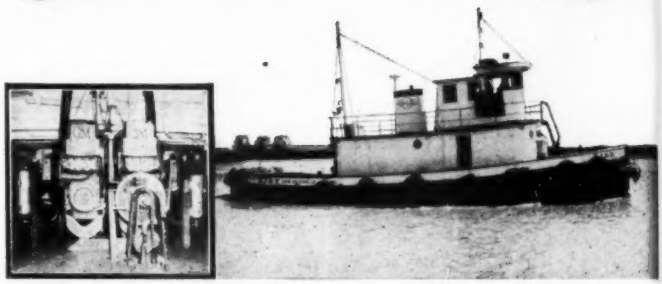

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ered gas-cut mud and trace of oil, TD 1,797 ft., elev. 2,697 ft.

Santa Cruz County, Bean Hills area: Union Oil Co. 1 Loma Prieta, 19-10s-1e, dry, TD 1,942 ft., elev. 1,000 ft.

MISSISSIPPI

New Production Found West of Mallalieu Field

JACKSON.—A new field or an extension to Mallalieu field, Lincoln County, Mississippi, is indicated by the W. B. Osborne 1 George Ziegler, located 1½ miles west of nearest production in Mallalieu field. The well was drilled to a total depth of 10,660 ft., and core taken at 10,552-58 ft. recovered 2 ft. of sand showing oil and 1 ft. of hard, sandy shale. Oil saturation throughout the 10,551-72 ft. sand was confirmed. Five-and-one-half-inch casing has been cemented on bottom and preparations are being made to perforate and test.

In Jefferson County, Mississippi, Stanolind Oil & Gas Co. 1 J. B. Dockery, in 17-10n-2e, has been drilled to total depth of 9,952 ft., and 5½-in. casing is now being run for production test. Log showed base Marine Tuscaloosa shale at 9,723 ft., sands 9,723-33, 9,738-48, 9,749-54 and 9,769-74 ft., all with resistance.

Carter Oil Co. is completing negotiations to drill a well in Smith County, Mississippi, 10n-14w.

George M. Harrison of Jackson has secured a farm-out on approximately 847 acres from Southern Natural Gas Co. and British-American Oil Co. centering the common corners of Townships 7 and 8, Ranges 1 and 2 west, Adams County, Mississippi. The agreement stipulates that Harrison must commence operations for the drilling of a Wilcox test not later than 60 days from July 9, 1949. However, to date, the exact location has not been staked. The acreage involved in the transaction is approximately 2½ miles west of the 1 G. R. Hightower, drilled by Claypool & Harrison, a wildcat recently abandoned.

Three new wildcat locations have been spotted for Florida during the week, one each in Levy, Monroe, and Suwannee counties. The one wildcat completion for Florida was located in Columbia County.

The eight new locations for Mississippi included six wildcat starts, one each in Franklin, Greene, Neshoba, and Perry counties, and two in Adams County. There were two wildcat completions in Mississippi, of which both were dry, and were located in Adams and Sharkey counties.

MISSISSIPPI WILDCAT FAILURES

Adams County: Claypool & Harrison 1 G. R. Hightower, in 10-7n-1w, dry, TD 6,521 ft.

Sharkey County: M. T. Halbouty & Jack Blalock 1 Espersen, in 7-11n-7w, dry, TD 3,493 ft.

FLORIDA WILDCAT FAILURE

Columbia County: Sun Oil Co. et al 1 Clarence Loyd, in 11-5s-17e, dry, TD 2,929 ft.

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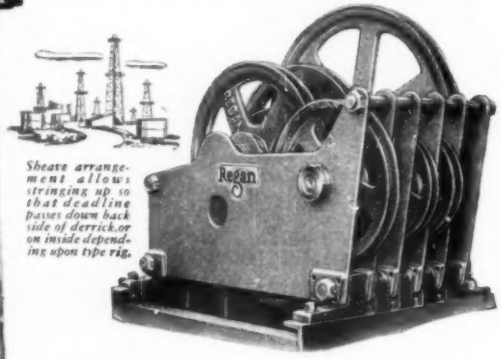

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LA.-ARK.

Oil Shows in Gas Well East of Bossier City

SHREVEPORT.—In Bossier Parish, 1 mile east of Bossier City, McAlester Fuel Co. 1-A Waller estate, SW SW 27-18n-13w, flowed gas and some oil, and was shut in for tanks and separators, due to its location near buildings and houses.

Cores at 5,556-61 ft., in the Pettit, recovered 5 ft. of slight porous lime with oil stain; at 5,561-66 ft. the recovery was 1 ft. 3 in. of broken lime with oil shows, and at 5,566-85 ft. there was 16 ft. of shale with no shows. Operators ran 5½-in. casing, perforated at 5,555-64 ft., and on a 2-hour production test flowed an estimated 1,500,000 cu. ft. of gas daily, plus some oil, estimated at 35° gravity. Total depth was 5,585 ft.

Caldwell Parish: Sohio Petroleum Co. 1-C LaSalle Land Co., 27-13n-5e, prepared to core the Tuscaloosa at 5,814 ft.

Catahoula Parish.—H. J. Strief 1 W. S. Peck, 41-10n-8e, was drilling in the Tuscaloosa at 8,077 ft.

Claiborne Parish.—Hunt Oil Co. 1 J. H. Owens, 19-23n-6w, was drilling in the Smackover at 11,712 ft., according to unofficial reports. Sample top on the formation was said to be 11,300 ft.

LaSalle Parish.—Two miles south of Nebo field, Justiss-Mears Oil Co. 1 J. E. Harris, 2-6n-3e, was plugged back to 4,050 ft., in the Wilcox. After reperforating at 4,004-14 ft. the well would not flow and operators were installing pumping unit. Swabbing recovered some oil and salt water.

In Union County, Arkansas, Dorsett Co. et al 101 H. S. Mills, NE SW NE 11-18s-14w, had drilling under way on a wildcat Smackover test. Cores in the Nacatoch at 2,263-82 ft. recovered shaly sand with oil shows.

Lion Oil Co. 1 Loftin, 34-18s-18w, 4 miles southwest of Schuler field, was drilling below 6,463 ft. in the Cotton Valley. Drilling was under way at Walter Lown 1 W. E. Baker, SE NE SE 22-16s-14w, 4 miles north of Champagnolle field. Southeast of Mount Holly field, Don D. Montgomery 1 Mahony, 25-17s-18w, was drilling in the Travis Peak below 5,100 ft. It is a Smackover test.

NORTH LOUISIANA WILDCAT FAILURE

Claiborne Parish: C. R. Schuster 1 F. M. Dance, 20-19n-6w, dry, TD 7,635 ft., PB 6,446 ft., Massive anhydrite 5,520-5,792 ft., Gloyd 6,156 ft., James 6,515 ft., elevation 274 ft.

Union Parish: Carter Oil Co. 1 G. S. Hicks, SE NW 22-21n-3w, dry, TD 8,501 ft., Wilcox 1,052 ft., Midway 1,491 ft.,

Arkadelphia 2,063 ft., Tokio 2,794 ft., James 4,364 ft., Pettit 4,863 ft., Travis Peak 4,953 ft., Cotton Valley 7,296 ft., Bodcaw sand 7,866-95 ft., elevation 206 ft.

Winn Parish: The Texas Co. 3 Urania Lumber Co., 10-12n-1e, dry, TD 3,196 ft.

ARKANSAS WILDCAT FAILURES

Calhoun County: Carter Oil Co. 1 Freeman-Smith, 15-15s-14w, dry, TD 3,316 ft., Arkadelphia 1,927 ft., Nacatoch sand 2,113 ft., Saratoga 2,303 ft., Travis Peak 3,100 ft., elevation 95 ft.

Union County: C. M. Bagley 1 Union Sawmill, SE SW SW 21-19s-13w, dry, TD 3,514 ft., Nacatoch sand 2,245 ft., Blossom 3,144 ft., James 3,084 ft., Hogg sand 3,304 ft.

OKLAHOMA

McClain County Wildcat Indicates New Oil Field

DISCOVERY of another new pool in McClain County is indicated by drill-stem tests in Cities Service Oil Co. 1 Dacus, C NW SW 29-5n-4w, 2½ miles west of the North Lindsay field. Testing the Bromide at a total depth of 11,350 ft., 180 ft. of free oil and 1,470 ft. of oil and gas-cut mud was recovered. In a previous test at 11,239-280 ft., 25 ft. of oil and 90 ft. of oil and gas-cut mud was recovered. Completion is waiting on cement to set after running 7-in. casing to 11,180 ft. The discovery may open a new trend of play west of the present famed Golden Trend.

Stanolind Oil & Gas Co. 1 Richardson Unit, SW SE NE 1-1n-1w, a mile north of the North Hoover pool, Garvin County, flowed at the rate of 5 bbl. per hour for 2¼ hours in a drill-stem test of saturated sand at 4,531-50 ft., and now is waiting on cement to set after running casing to complete.

A possible ¾-mile northward extension to Southwest Panther Creek pool, Garvin County, is in the making at Superior Oil Co. 62-27 Brock, SE NW NW 27-3n-3w, where drill-stem testing of a series of oil zones is under way. In the latest test, casing, cemented on bottom at 7,820 ft., was perforated at 7,786-96 ft., from which zone a recovery of 270 ft. of oil-cut mud was made. From perforations at 7,540-60 ft., the well flowed 39.8 bbl. in 8 hours with a pressure of 300 to 400 psi. Perforations at 7,716-42 ft. gave a recovery of only 90 ft. of mud.

Sterling Oil Co. of Oklahoma, Inc., 1 White, NE SW NE 9-11n-6e, 1¼ miles southeast of the Prague pool in Pottawatomie County, encountered 8 ft. of good saturation in the Misener sand and looks like another pool opener. Saturation was at 4,299-4,307 ft. with top of the sand at 4,297 ft. In a drill-stem test of the zone with the tool open 1½ hours, gas showed in 66 minutes and bottom-hole pressure of 600 psi. was recorded. However, only 35 ft. of slightly oil and gas-cut mud was recovered. Hole is being deepened in exploration of lower horizons.

The new West Sholem Alechem pool in Stephens County has been given a second Hoxbar sand well by the completion of Davon Oil Co. 1 Precise, SW NW NE 22-1s-4w, which flowed 106 bbl. in 12 hours through 2½-in. tubing from open hole at 3,530-76 ft. This is a 10-acre north offset to the discovery well, completed in March from the same pay. It is the third well for the pool but the second well, ¼ mile south of the discovery well, is producing from the Deese sand at 4,822-41 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Carter County: Rock Hill 1 Moyer-Scrivner, SE NW NW 1-5s-2w, pumped 15 bbl. of 35°-gravity oil per day from Lone Grove sand at 4,264-78 ft., TD 4,300 ft.

Cleveland County: Tepee Drilling Co. 1 Warner, C SE NE 4-6n-1w, pumped 36 bbl. of 46°-gravity oil per day from sand at 6,548-63 ft., TD 6,655 ft.

Cotton County: Graham 1 Bates, SE NE NE 20-3s-11w, pumped 10 bbl. of 35°-gravity oil per day from sand at 1,571-85 ft., TD.

Lincoln County: New pay in Hoyt field—Stephens 1 Dawson, NW NE NW 4-14n-3e, flowed 50 bbl. of oil per day from Hunton at 4,830-38 ft., OTD 5,105 ft., old well worked over.

Major County: Mazda 1 Farnsworth, NE NW NW 2-21n-10w, flowed 246 bbl. of 39.2°-gravity oil per day from Manning at 6,762-6,856 ft., TD 6,835 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: Wilcox 1 Sanders, NW NW NE 6-5s-10w, dry, TD 2,015 ft., sand 1,214-25 ft., 1,295-1,310 ft., 1,425-43 ft., 1,598-1,620 ft., and 1,645-65 ft., Megargle 1,725 ft., sand 1,975-90 ft.

Garfield County: HER Drilling 1 Gaines, SW SW NE 23-21n-3w, dry, TD 5,885 ft., Woodford 5,677 ft., Misener 5,740 ft., Viola 5,760 ft., Wilcox 5,821 ft., second Wilcox 5,873 ft.

Garvin County: Benson Bros. 1 Freeman est., SW NE NE 31-1n-1e, dry, TD 1,443 ft.

Jefferson County: Massad 1-A Featherston, NE NE SE 21-3s-5w, dry, TD 2,360 ft.

Lincoln County: Trigg 1 State School Land, NE NW NE 36-17n-5e, dry, TD 3,499 ft., Avant 1,738 ft., Hogshooter 2,036 ft., Layton 2,088 ft., Checkerboard 2,330 ft., Oswego 2,905 ft., Verdigris 3,090 ft., lime 3,248 ft., Inola 3,384 ft., coal 3,399 ft., Bartlesville 3,404 ft., Bartlesville sand 3,442 ft., and 3,458 ft.

Blackwell 1 Bass, SE SE SW 29-17n-6e, dry, TD 3,363 ft., Oswego 2,830 ft., Prue 2,930 ft., Verdigris 3,070 ft., Skinner 3,085 ft., lime 3,162 ft., Red Fork 3,207 ft., Inola 3,293 ft., Bartlesville 3,315 ft., Bartlesville sand 3,327 ft.

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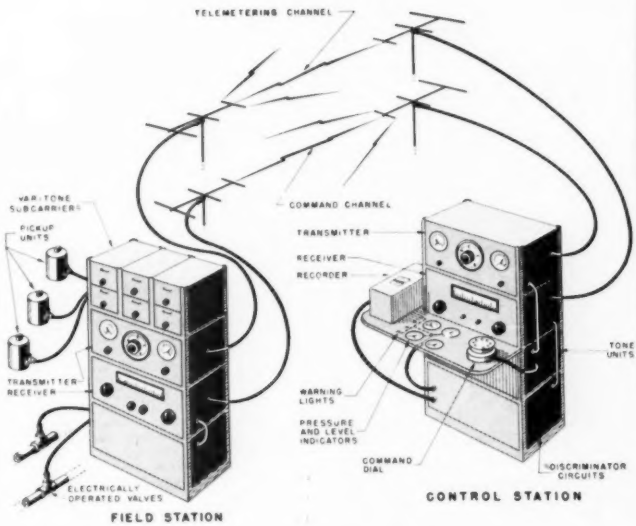

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- Control flow rates, pressures, and other variables at single or multiple remote stations.
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Okmulgee County: Mee 1 Peterson, SW SE NE 27-16n-14e, dry, TD 1,845 ft.

Pawnee County: Olson 1 Moffitt, C NW NE 6-23n-5e, dry, TD 3,435 ft., Hoover 1,335 ft., Tonkawa 1,850 ft., Osage-Layton 2,200 ft., Layton 2,350 ft., Oswego 2,854 ft.

Tillman County: Gutowsky 1 Cunningham, NW NW NE 19-2s-18w, dry, TD 6,099 ft., Canyon 3,508 ft., Viola 5,974 (?) ft.

N. CENTRAL TEXAS

Haskell County Test Indicates New Pool

WICHITA FALLS.—A reef limestone field was in prospect for Haskell County, 3 miles southwest of Haskell, at Stanolind Oil & Gas Co. 1 John Pace, T. G. Owings Survey. Operators drilled plug at 3,610 ft. and swabbed at the rate of 2 bbl. of oil an hour, then drilled an additional 5 ft. and treated with 200 gal. of acid. Recovery from swabbing had increased to about 5 bbl. an hour when the well kicked off and flowed 113 bbl. of oil in 4 hours, cut with 2 per cent wash water and acid. The flow was through 16/64-in. choke. At last report it was shut in for storage.

Montague County.—Stanolind 1 Louise Barker, Section 12, Limestone CSL, northwest of Bowie, ran a 1-hour drill-stem test in the conglomerate section at 6,167-90 ft. Gas came to the top in 4 minutes and the recovery was 1,175 ft. of clean oil, plus 30 ft. of heavily oil-cut mud. The well headed some oil while coming out of the hole. Flowing pressure was 275 psi., and bottom-hole shut-in pressure was 1,822 psi. in 20 minutes. Total depth was 6,350 ft.

Konrad Sztykgold 1 G. W. Cox, Section 21, Limestone CSL, 1 mile southwest of Stoneburg, was drilling below 5,726 ft.

Four miles southwest of Montague, The Texas Co. 5 Great Southern Life Insurance Co., N. S. Ussery Survey, A-824, was drilling shale and lime at 5,750 ft.

Reagan Caraway staked location for 1 Crow, 330 ft. from south and 1,220 ft. from east lines, J. P. Francis Survey, 3½ miles north of Maguire conglomerate field. Contract depth was 5,400 ft.

Clay County.—On the east side of Lazy B (Caddo) field, Gulf Oil Corp. 1-B C. W. Scaling, Block 98, J. H. Belcher Survey, was showing for a new pay discovery in the Strawn. Top of the zone was 4,451 ft. Operators drilled to 4,525 ft., and ran an 80-minute drill-stem test, which had gas at the surface in 12 minutes and recovered 1,200 ft. of free oil plus 90 ft. of heavily oil-cut mud. Flowing pressure was 300 psii. Drilling continued below 4,865 ft.

Continental Oil Co. 1-A W. P. Ferguson, wildcat 3 miles north of Jolly, in Block 49, Plemons Survey, was held up by a fishing job at 3,502 ft.

Fain & McGaha 1 Shaver, 5,600-ft. wildcat 2½ miles southwest of Deer Creek, was drilling below 3,000 ft.

Young County.—Two miles southwest of Proffitt, Warren Oil Corp. 6 Fred W. Dowda, Section 721, TE&L Survey, flowed 616 bbl. of oil in 18 hours through 16/64-in. choke, from the Caddo at 3,808-19 ft. The well was formerly producing from a sand at 2,576 ft.

Throckmorton County.—James H. Snowden 1 George Dickey Unit, Section 686, TE&L Survey, ½ mile southwest of Throckmorton, flowed an unestimated amount of oil into pits after drilling out casing set at 4,514 ft. Completion test was to be made from 4,518-21 ft.

Three miles west of Woodson, Woodley Petroleum Corp. 2 Leathers, Section 934, TE&L Survey, set pipe at 4,598 ft. following a 90-minute drill-stem test of the Mississippian at 4,568-80 ft. Recovery was 10 ft. of mud, with no shows. An earlier test from 4,411-37 ft., open 30 minutes, had gas at the top in 1 minute and flowed oil for 6 minutes.

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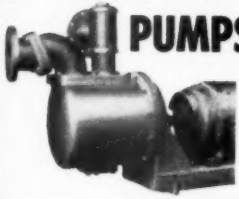

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Warren Oil Corp. staked location for 1-A Mrs. B. C. Coleman, 330 ft. from south and 467 ft. from west lines of Section 2,316, TE&L Survey, 8 miles northeast of Woodson. It is a 5,000-ft. rotary test.

Southwest of Woodson, Toklan Production Co. 1 J. Herrington, Section 903, TE&L Survey, was dry at 4,599 ft. Operators drillstem tested the Mississippian at 4,547-54 ft. and recovered 6 ft. of mud with no shows.

North of Woodson, Taylor-Kirby Drilling Co. 1 B. F. Askew, semiwildcat in Block 952, TE&L Survey, was below 4,220 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Coleman County: Dale Smith and M. R. Rogers 1 M. A. Kirkpatrick, Sec. 61, HT&B Sur., 1 mi. SE Santa Anna, pumped 46 bbl. 43°-gravity oil a day, sand 1,710-35 ft., GOR 550 cu. ft., TD 1,795 ft., PB 1,735 ft.

Jones County: J. C. Drilling Co. 1 H. C. Harvey, 11-14-T&P, 3 mi. SE Nugent, pumped 100 bbl. 39°-gravity oil in 4 hr., sand 1,698-1,719 ft., TD.

Stephens County: Algord Oil Co. 2 J. K. P. Hughes, Sec. 1, MEP&P Sur., 13 mi. NE Caddo, flowed 917,000 cu. ft. of gas daily, Caddo 3,938-44, 3,956-68 ft., TP 55 psi., TD 4,137 ft., PB 3,998 ft.

Throckmorton County: James H. Snowden 1 G. D. Dickie Unit 1, Sec. 686, TE&L Sur., ½ mi. SW Woodson, flowed 125½ bbl. 41°-gravity oil in 4 hr., 3/8-in. choke, Caddo 2,513-21 ft., GOR 675 cu. ft., CP 650-375 psi., TP 800-525 psi., TD 4,531 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: H. & H. Enterprises, Inc., 1-A Boon lease, J. S. Swisher Sur. 17, 8 mi. NE Megargle, dry, TD 1,410 ft., no shows.

J. M. Hawley 1 J. D. Carpenter "C," Lot 91, Blk. 4, Clark & Plumb Subd., 5 mi. W. Windthorst, dry, TD 1,151 ft.

Comanche County: Jimmie Rosenthal 1 James, 34-2-H&TC, 6 mi. N DeLeon, dry, TD 3,400 ft., Marble Falls 2,783 ft., light oil show, Ellenburger 3,307 ft., elevation 1,332 ft.

Eastland County: R. W. Fair 1 E. P. Crawford, W. Read Sur., 3¼ mi. SE Nimrod, dry, TD 3,872 ft., Caddo 2,679 ft., Marble Falls 3,218 ft., Ellenburger 3,681 ft.

James H. Snowden 1 Sadie Brizendine, Sec. 9, ETRR Sur., 2½ mi. NE Rising Star, dry, TD 3,010 ft., Caddo 2,660 ft., Marble Falls 2,917 ft., elevation 1,620 ft.

Fisher County: Mid-Continent Petroleum Corp. 1-A Menko Leeper, NE NE 186-3-H&TC, 9 mi. SW Roby, dry, TD 7,001 ft., Hope lime 4,160 ft., Cisco 4,225 ft., Gunsight 4,360 ft., Palo Pinto 5,352 ft., Reef 6,003 ft., Mississippi 6,05 ft., Ellenburger 6,799 ft., elevation 2,116 ft., DST 5,059-5,106 ft. recovered 35 ft. of mud and oil, DST 5,239-46 ft. recovered 630 ft. of gas, 25 ft. oil-cut mud, DST 5,240-78 ft. recovered 720 ft. of gas, DST 6,005-25 ft. recovered 93 ft. salty mud.

Jack County: Akin & Dimock 1 R. A. Owen, G. Gates Sur., 2 mi. SE Matlock field, dry, TD 5,686 ft., Caddo 4,547 ft., shows of oil and gas on DST's 4,917-51 ft.

Jones County: Ray Oil Co. 1 A. F. Young, H. Millard Sur., 2½ mi. SE Hawley, dry, TD 2,450 ft.

Sojourner Drilling Co. 1 R. L. Harrison, 49-1-BBB&C, 5½ mi. SW Stamford, dry, TD 5,010 ft., Flippen 2,364 ft., elevation 1,624 ft.

Nolan County: Sun Oil Co. 1 Mary S. B. Cook, SE NE 29-X-T&P, 11 mi. SW Sweetwater, dry, TD 7,402 ft., tops not reported.

Palo Pinto County: C. K. West 1 Lane, 14-4-T&P, 5 mi. NE Caddo, dry, TD 1,601 ft.

Parker County: Continental Oil Co. 1 C. P. Johnson SW SW 275-T&P 6 mi. SW Poolville, dry, TD 6,74 ft., Strawn 3,450 ft., Caddo 3,597 ft., conglomerate 3,998 ft., Marble Falls 4,656 ft., Barnett 5,508 ft., Ellenburger 5,767 ft., elevation 1,198 ft.

Wichita County: Roy H. Lebus, 3 Will Burnett, W. Williams Sur., 5 mi. SW Iowa Park, dry, TD 1,487 ft.

KANSAS

Barton County Wildcat Shows for Oil Producer

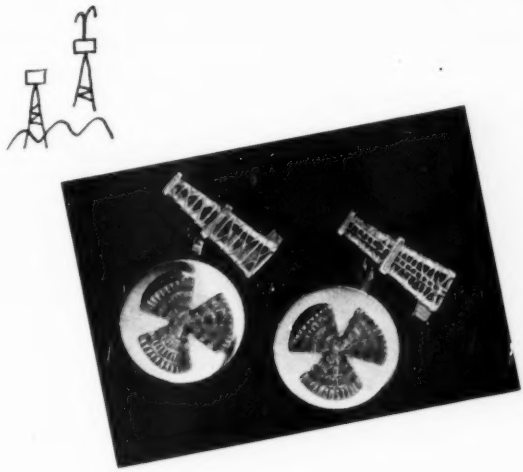
ANOTHER new pool is virtually assured in eastern Barton County where El Dorado Refining Co. recovered 2,550 ft. of oil and 50 ft. of oil-cut mud in a drill-stem test of the Arbuckle in its 1-B Stumps, NW NW SE 24-18-11. Test was made at 3,284-99 ft. with the Arbuckle topped at 3,283 ft. (—1,511 ft.). Indicated bottom-hole pressure was 1,020 psi. Casing (5-in.) has been run to 3,285 ft. The well is 2 miles east of the Ames pool and 2 miles southwest of the Gemeinhardt pool (western Rice County).

In the northern part of the same county, Ferrell Drilling Co. 1 Christians, SW SW NE 20-16-12, 1 mile southwest of Beaver pool and 1½ miles northwest of Laudick pool, also found good saturation in the Arbuckle, topped at 3,329 ft. (—1,418 ft.), and is moving in cable-tool unit to test after running casing to 3,330 ft. Rotary hole was drilled to 3,332 ft. Top of the Arbuckle is 30 to 40 ft. higher than in wells in the nearby Laudick pool.

M. B. Armer also has a possible new pool opener in his 1 Dreiling, SE SE NE 21-14-16, southeastern Rice County, in which good shows were encountered in the Arbuckle, topped at 3,366 ft. (—1,502 ft.). Rotary hole was drilled to 3,388 ft. and 5-in. casing run to 3,377 ft. Nearest production is the Herzog pool, 6 miles northwest.

Drillers Gas Co. 1 Warkentin, SE SE NW 16-23-3w, 1 mile east of the Burton pool, Harvey County, is preparing to test showings encountered in the Mississippian. Pay was topped at 3,261 ft. (—1,799 ft.) and drilled to 3,328 ft., where 5-in. casing was cemented.

Production in the active Berland area in southwestern Rooks County was extended



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¾ mile eastward by Sunray Oil Corp. and Heathman-Honaker Drilling Co. 1 Richardson, NW NW NW 17-10-19, which was completed with a potential rating of 267 bbl. per day from the Arbuckle at a total depth of 3,766 ft. Top of the pay was 3,766 ft. (—1,568 ft.).

Petroleum, Inc., and associates are extending the Southwest Zyba pool, Sumner County, a half mile south in their 1 Hurst, NW NW SE 22-30-1w. In a drill-stem test of the Simpson sand at 3,918-33 ft. (elevation 1,282 ft.), a recovery of 1,600 ft. of gassy oil was made, and while pipe was being pulled, gas pockets caused the well to flow over the top of the derrick twice. Casing has been cemented at 3,920 ft.

Three-quarters of a mile west of production in the Chase field, Rice County, Henderson Oil Co. 1 Proffitt, SW SW NW 13-20-10, made 62 bbl. per day on potential test following a 1,500-gal. acid treatment. Pay is the Arbuckle, topped at 3,339 ft. (—1,553 ft.) and bottomed at 3,345 ft.

KANSAS SUCCESSFUL WILDCAT

Stafford County: M. B. Armer 1 Andress, NE NE SW 2-21s-13w, 242 bbl. of oil per day from Arbuckle at 3,514-28 ft., TD.

KANSAS WILDCAT FAILURES

Barton County: Phillips & Hansen 1 Underwood, NW NW SW 9-17s-13w, dry, TD 3,395 ft.

Cowley County: Derby Oil Co. and E. K. Carey 1 Coulter, NW SW SE 26-30s-5e, dry, TD 2,980 ft.

Ellis County: Francis Oil & Gas Co. 1 Fischer, NW NW NE 8-11s-20w, dry, TD 3,713 ft.

Trime Drilling Co. 1 Clotz, NE NE NE 28-12s-16w, dry, TD 3,543 ft.

Sohio and Veeder Supply 1 Foster-Aley, NW NW NE 13-13s-16w, dry, TD 3,427 ft.

Kingman County: R. C. Patton et al 1 Harding, NE NE NW 12-27s-5w, dry, TD 4,086 ft.

Marion County: H. & M. Drilling Co. et al 1 Koebele, SW SW SW 19-22s-5e, dry, TD 2,660 ft.

Stafford County: Westgate-Greenland Oil Co. 1 Wolf, SE SE NE 7-22s-11w, dry, TD 3,727 ft.

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TEXAS GULF COAST

Cockfield Sand Production Found in Tyler County

HOUSTON.—First Cockfield sand production for the East Hillister pool of Tyler County, which produced from the Wilcox, was opened with completion of Humble Oil & Refining Co. 3 William Rice Institute, Arthur Hutchins Survey. The new producer flowed 65 bbl. of 38.6°-gravity oil plus 384 M.c.f. gas per day through a ¹⁄₈-in. choke. Total depth of the well is 7,446 ft. and production is through perforations at 4,946-49 ft.

A new sand has been opened on the northeast flank of the Manvel pool of Brazoria County by Jack Frazier 1 Campbell-Bredenburgh, which flowed 138 bbl. of 26°-gravity oil through 11/64-in. choke under tubing pressure of 280 psi. Total depth of the well is 5,612 ft., and completion was made through perforations at 5,612-19 ft.

Oil production in the Buck Snag area of Colorado County has been confirmed with the completion of Claud B. Hamill 1 Elvira K. Stephens, which flowed 17.5 bbl. of 41.8°-gravity oil per day through 12/64-in. choke. Total depth of the well is 7,000 ft., and production is through perforations at 6,124-30 ft.

A new sand has been discovered in the Hankamer area of Liberty County by the R. Olsen Oil Co. A-1 Ezzell, in the Levi Barrow Survey, which flowed 431 bbl. of 26°-gravity oil per day through ¼-in. choke with flowing pressure on the tubing at 410 psi. The well was drilled to a total depth of 4,294 ft., and production is through perforations at 4,258-94 ft. in the Miocene.

A new gas-condensate pay zone has been opened by W. L. Goldston 1 Elsie Landgrebe, new southeast extension to West Weesatche field, Goliad County. The well was drilled to total depth of 8,150 ft., with 5½-in. casing on bottom, and production is through perforations at 8,060-75 ft. Shut-in pressure was 2,900 psi., but no gage of the production is known as yet. Located approximately ½ mile southeast of the Smith & McBride 1 Carl Weise discovery, in the M. J. Carico Survey A-90.

The 46 new locations on the Gulf Coast included 11 wildcat starts, 1 each in Bee, Live Oak, Chambers, San Jacinto, and Wharton counties, and 2 each in Refugio, Jefferson, and Matagorda counties. Four exploratory tests were successful, one each in Goliad, Brazoria, Liberty, and Matagorda counties, while five were dry, one each in Jackson, Refugio, Brazoria, Chambers, and Harris counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Brazoria County: New pay, at Manvel, Jack W. Frazier 1 Campbell-Brendenburgh Unit, in E. Little Sur., A-320, top sand 5,612 ft., TD 5,729 ft., perf. 5,612-19 ft., IP 138 bbl. oil per day through 11/64-in. choke, TP 280 psi., 26° gravity.

Goliad County: Two new pays, at Marshall Sunray Oil Corp. 1 J. B. Danforth, in Solomon Griffin Sur., A-126, dual completion, top sand 4,910 ft. (Yegua), top sand 8,924 ft. (Massive Wilcox), TD 9,502 ft., perf. 4,910-24 ft., and 9,233-82 ft., IP: 2,300 M.c.f. gas per day on open flow, SIP 3,225 psi.

Liberty County: New pay, at Hankamer—R. Olsen Oil Co A-1 Ezzell, Levi Barrow Sur., top sand 4,258 ft., TD 4,292 ft., perf. 4,258-94 ft., IP: 431 bbl. oil per day through ¼-in. choke, GOR 200, TP 410 psi., 26° gravity.

Matagorda County: New pay, at Arch—Rowan Oil Co. & Texas Gulf Producing Co. B-1 Denmarr Kountze et al, in

I&GN Sec. 17, top sand 7,437 ft. and 7,645 ft., TD 8,721 ft., TD 8,721 ft., perf. 7,437-38 ft., and 7,645-46 ft., IP: 41.2 bbl. condensate per day plus 1,402 M.c.f. gas per day through 1/4-in. choke, TP 2,661 psi.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Brazoria County: C. H. Alexander A-1 Blumer Heirs, in Lot 161, HT&B Sec. 28, approximately 2 mi. SE of Pearland, dry, TD 9,800 ft.

Harris County: Butcher-Arthur, Inc., 1 John M. Kilgore, C. Smith Sur., A-69, 1 mi. NE of Cedar Bayou, dry, TD 7,890 ft.

Jackson County: P. T. Sharples 1 Edmonia Pressly, at Cordele, in Peter White Sur., 10 mi. N of Edna, dry, TD 5,202 ft.

Refugio County: Southern Minerals Corp. 1 J. C. West, in J. Coughlin Sur., A-18, 1 1/2 mi. NW of Southern Minerals 1 Perryman discovery, dry, TD 6,153 ft.

EASTERN TEXAS

Confirmation Test Begins On 2-Year-Old Discovery

DALLAS.—Stanolind Oil & Gas Co. began moving in material for a confirmation test to a 2-year-old Pettit gas-distillate discovery in the Highland Lake area 9 miles northeast of Marshall. The test is to be the 1 Highland Lake Club, J. C. Post Survey, approximately 2,400 ft. north and slightly west of the 1 George Slaughter, J. E. White Survey, discovery well for the area.

In Kaufman County, preliminary tests on the R. W. Fair 1 Wynne, Newman Survey, tanked 418 bbl. of 31°-gravity oil from perforations in the Paluxy sand at 4,965-83 ft., flowing through 1/2-in. choke. Following that test, the well flowed 230 bbl. of oil in 24 hours through 10/64-in. choke, with a flowing pressure of 280 psi.

In Grayson County, 1 mile east of Sherman, Standard Oil Co. of Texas 1 Beth Brown, 2,350 ft. from north and 1,050 ft. from west lines, Henry C. Achison Survey, completed its fourteenth core, and eleventh drill-stem test in the Strawn, which showed prospects of extending Strawn 2 miles southeast of Sherman field.

The well logged a show of oil in sand at 2,708 ft., and ran its first core from 2,843-58 ft., which recovered sand with stain, odor, and fluorescence. Top on the Strawn was not reported. Additional cores to 3,574 ft. had various shows of oil.

Drill-stem tests and results were: From 2,837-58 ft., recovered 90 ft. heavily oil and gas-cut mud, 180 ft. of lightly oil and gas-cut mud, bottom-hole pressure 500 psi.; 3,044-74 ft., recovered 40 ft. heavily oil and gas-cut mud, bottom-hole pressure 625 psi.; 3,088-96 ft., recovered 270 ft. of 29°-gravity oil, bottom-hole pressure 1,350 psi., flowing pressure 85 psi.; 3,094-3,110 ft., 265 ft. of heavily oil and gas-cut mud; 3,120-38 ft., recovered 1,650 ft. of gas, 30 ft. of oil, and 210 ft. of oil-cut mud, flowing pressure zero, bottom-hole pressure 1,200 psi.; 3,163-3,225 ft., showed increase in gas, plus 765 ft. of oil; 3,287-3,300 ft., gas in 55 minutes, recovery in 60 minutes was 1,350 ft. of 29°-gravity oil, flowing pressure 400 psi., bottom-hole pressure 1,275 psi.; 3,348-59 ft., recovered 510 ft. of 30°-gravity oil, bottom-hole pressure 1,550 psi., flowing pressure 220 psi.; 3,400-17 ft., recovered 890 ft. of oil; 3,417-44 ft., recovered 1,260 ft. of oil, bottom-hole pressure 1,550 psi. in 20 minutes, flowing pressure 375 psi.; 3,505-23 ft., recovered 60 ft. of salty oil-cut mud, 180 ft. muddy salt water.

Fourteenth core in the Strawn from 3,564-74 ft. recovered 6 ft. of sand with stain, 1 1/2 ft. of sand, and 6 in. of additional stained sand. Operators prepared to core ahead below 3,798 ft. Proposed depth of the well was 5,000 ft.

B. G. Byars and R. L. Peveto 1 Mark

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Talley, prospective Paluxy well 2 miles southwest of Hagansport in Franklin County, continued to test on the pump after running casing to 4,417 ft. and perforating at 4,412-17 ft. with 50 shots. In 24 hours it pumped 98 bbl. of 23°-gravity oil, cutting less than 1 per cent sediment and water. Corrected total depth was 4,417 ft. Top of the Paluxy, by cores, was 4,403 ft., on an elevation of 391 ft.

Dan Lester Drilling Co. made location for 1 M. L. Edwards, 990 ft. from south and 330 ft. from west lines, 81-acre tract, in the George McCarty Survey, 1 mile south and slightly west of Hagansport. Projected depth was 5,000 ft. to test the Paluxy.

In Harrison County, Atlantic Refining Co. 1 M. P. Isom, E. A. Merchant Survey, 7 miles northwest of Hallsville, had total depth at 7,804 ft. in sand and shale and prepared to drill ahead. A drill-stem test of the Travis Peak at 7,754-7,804 ft., open 1 hour, using 1,465 ft. of water cushion, ¼ bottom and 1-in. top chokes, produced a light to strong blow of air and recovered the water cushion plus 45 ft. of lightly gas-cut drilling mud. Bottom-hole flowing pressure ranged from 690-708 psi. Shut-in pressure was 1,275 psi. in 20 minutes.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) WILDCAT FAILURES

Bosque County: American Liberty Oil Co. 1 J. W. Clanton, William McFarland Sur., 1 mi. SE Iredell, dry, TD 6,995 ft.

Grayson County: J. R. and Adam Seitz 1 Roberson & Squyres, Aaron Burleson Sur., 3 mi. E Sherman, dry, TD 5,523 ft.

Leon County: W. L. Pickens 1 M. E. Black estate, D. M. Frisman Sur., 2 mi. SE Jewett, dry, TD 6,500 ft., Austin 5,333-5,674 ft., sub-Clarksville 5,689-5,737 ft., Woodbine 6,140 ft., Georgetown 6,467 ft., elevation 391 ft.

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SOUTH LOUISIANA

New Discovery Indicated For Plaquemines Parish

NEW ORLEANS.—A new discovery is indicated for Plaquemines Parish, southwest of old Lake Washington production, by Humble Oil & Refining Co. 1 State Lake Washington Lease 1465. The well flowed 1 bbl. of fluid per hour, 40 per cent wash water and 60 per cent 20°-gravity oil in initial test through perforations at 9,412-24 ft. and 9,436-44 ft. through ¾-in. choke. The well was drilled to 9,653 ft., and plugged back to total depth of 9,483 ft. before perforating for production.

Testing continues on the Sid W. Richardson 1 Ada Miller Soileau, wildcat in the Durald area of Evangeline Parish, 31-5s-2w, approximately 8 miles southwest of Reddell production. The well was drilled to total depth of 12,832 ft., and plugged back to 11,360 ft. after attempting to blow-out. The string was perforated at 11,304-16 ft. and flowed 137 bbl. of fluid per day through 5/32-in. choke, with tubing pressure at approximately 2,600 psi. Operators continue to test.

Owners and officials are considering the intentional firing of a wild gas well which is shooting geysers of distillate high into the air. The well is located in the upper Grande Bayou area of Pointe a la Hache field, Plaquemines Parish. Barges have been sunk around the well to reduce the water level at the hole and experts are awaiting additional equipment to try to cap the well. Permission to fire the well has been granted by the State Conservation Commissioner if the experts think this procedure necessary.

A new sand for the Bay Junop area, Terrebonne Parish, 27-21s-14e, has been opened by Union Oil Co. of California 9-5 State Lease 725. The well was drilled to a total depth of 4,560 ft., and is producing 84 bbl. of 40.7°-gravity oil per day through a 6/64-in. choke from perforations at 4,500-04 ft., with tubing pressure of 1,000 psi.

W. B. Jayred 1 Mayo Stutes, confirmation test for the Duson area, in 32-9s-3e, Lafayette Parish, is now testing for production. Well was drilled to total depth of 10,917 ft., and 5½-in. oil string was set at 10,900 ft. Oil string was perforated at 10,874-80 ft. and 10,884-91 ft.

Operators are now testing J. R. Frankel 2 Clotilda Plantation, wildcat in Lafourche Parish, 12-16s-19e. Total depth of the well is 12,905 ft., and oil string has been perforated at 12,242-52 ft. for production.

The 24 new locations in South Louisiana included two wildcat starts, one each in Beauregard and Rapides parishes. There were two successful exploratory tests completed this week, one each in Jefferson and Terrebonne parishes, while two were dry, one each in Calcasieu and Cameron parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Jefferson Parish: New oil pool, Avondale—Humble Oil & Refining Co. 1 T&NO RR, in 26-13s-22e, top sand 8,813 ft., TD 10,299 ft., perf. 8,183-88 ft., IP: 219 bbl. oil per day through 12/64-in. choke, GOR 566, TP 600 psi., 31° gravity.

Terrebonne Parish: New pay, at Bay Junop Union Oil Co. of Calif. 9-5 St. Lease 725, in 27-21s-14e, top sand 4,500 ft., TD 4,560 ft., perf. 4,500-04 ft., IP: 84 bbl. oil per day through 6/64-in. choke, GOR 500, TP 1,000 psi., 40.7° gravity.

SOUTH LOUISIANA WILDCAT FAILURES

Calcasieu Parish: W. B. Jayred 1-B Willis W. Gayle, in 25-11s-8w, 3 mi. SE of So. Lake Charles production, dry, TD 11,510 ft.

Cameron Parish: Magnolia Pet. Co. 2 St. Lse. 1250-Calcasieu Lake, in Mud Lake area, 7-14s-10w, dry, TD 10,773 ft.

PERMIAN BASIN

Offset to Upton Discovery Has Encouraging Tests

MIDLAND.—Magnolia Petroleum Co.'s 2-30 Roy Glass, SE SW 3-40-TP, northeast offset to its Pegasus discovery, north Upton County, had flowing oil on its first test in the Pennsylvanian. After a second drill-stem test, which also recoverd considerable oil, operators were drilling ahead below 10,239 ft., to the Ellenburger.

First test, in the top of the Pennsylvanian at 10,132-73 ft., open 2½ hours, had gas in 2 minutes, drilling mud and oil in 15 minutes, which was allowed to clean into tanks for 16 minutes, then it flowed into tanks for 2 hours, gaging 46.75 bbl. of 51°-gravity oil or distillate. There was no formation water. Shakeout was six-tenths of one per cent drilling mud. The test was through ⅝-in. bottom and 1-in. top chokes. Gas-oil ratio was 4,940 cu. ft. Flowing pressures were 140-320 psi. at the surface, and 950-1,100 psi. bottom-hole. Shut-in bottom-hole pressure was 4,090 psi. in 15 minutes.

The second test, from 10,174-10,215 ft., had gas in 7 minutes, gaged at 287,000 cu. ft. daily, and recovered 1,350 ft. of oil, plus 720 ft. of heavily oil and gas-cut mud. It did not flow. Shut-in bottom-hole pressure was 3,850 psi. Chokes used were ⅝-in. and 1-in.

Operators reported the 2-30 Glass was running approximately flat, on the Pennsylvanian, with the 1-A TXL, which also showed for production in the Pennsylvanian, and the Devonian. Location of the well is across the line in Midland County.

Phillips Petroleum Co. 1-BB TXL, northwest offset location in SE SE 25-41-T4S-T&P, was drilling plug from casing cemented at 4,173 ft. Total depth was 5,164 ft.

Mitchell County.—Field reports on Superior Oil Co. 1 Dockery, wildcat located 3½ miles southwest of the town of Westbrook, indicated discovery production in the Ellenburger, although operators of the test did not confirm such reports. Top on the Ellenburger was said to be from 7,968-90 ft. A drill-stem test around 8,004-24 ft. filled the drill pipe at the rate of 80 bbl. of fluid an hour, of which 70 bbl. was 45°-gravity oil and the balance oil and gas-cut mud. Oil was said to have come to the surface in 60 minutes, at which time the tool was closed. Location is NE NE 17-28-TP Survey, about 3 miles south of Clear Fork production in Westbrook field.

Schleicher County.—Lone Star Producing Co. announced location for a 6,500 ft. wildcat, 9 miles south of Christoval and about 3 miles south of the Tom Green County line. The proposed test, 1 Clint Pinson, SW SW 69-M-GH&SA, is located 3¾ miles west and ¾ mile south of Phillips' 1 Mrs. W. J. Weddell, which completed as a small pumper at 5,630-5,700 ft.

Borden County.—New exploration work announced included: Amerada Petroleum Corp. 1 J. R. Canning, approximately NE NE 117-25-H&TC, in the southeastern part of the county, and about 5 miles west of Sharon Ridge Canyon field of Scurry County. It is an Ellenburger test, contracted to 9,000 ft.

Sinclair Oil & Gas Co. staked an east offset location to its 1 Sterling Williams, for the 1 T. P. Turner, NW NW 46-32-T6N-EL&RR. Rotary was being moved in for the 10,000-ft. test at last report.

Gaines County.—On the northwest side of Doss field, (middle Permian around 7,200 ft.), Ralph Lowe 1 Cunningham-Shell, SW NW 4-A24-PSL, was flowing into pits to clean, following a 500-gal. mud-acid treatment of the Canyon limestone from 8,850-8,950 ft. The well kicked off after being swabbed and flowed an ungaged amount of oil and acid residue, with no formation water. Total depth was 11,881 ft., in the Ellenburger which carried salt water. It was plugged back to 11,050 ft. where 7-in. casing was set. The new well marks a ½-

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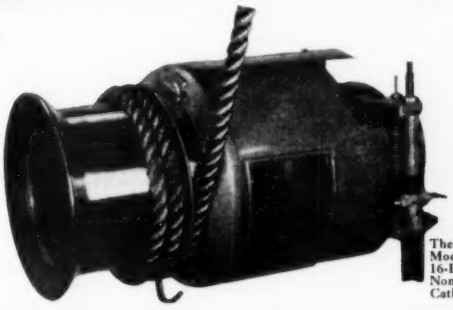

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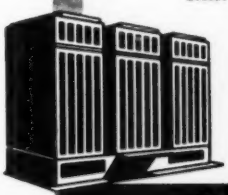

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mile west extension and new pay for the field. Some reports were calling the pay Wolfcamp.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCAT

Ector County: Forest Oil Corp. 1 Phillips-TXL, NE NW 25-45-T1S-T&P, between south ends of Goldsmith and TXL fields, pumped 200 bbl. 35°-gravity oil a day, 25 bbl. water, GOR 625 cu. ft., Clear Fork 5,740-6,260 ft., TD 6,300 ft., PB 5,957 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Andrews County: Anderson Prichard Oil Corp. 1-D University, 38-7-University Lands, 6½ mi. N Mabee field, dry, TD 5,055 ft., Yates 3,090 ft., Grayburg 4,450 ft., elevation 2,948 ft.

Crockett County: The Texas Co. 2 Victor L. Pierce, SE NE 10-000-GC&SF, 21 mi. S Ozona, dry, TD 12,105 ft., Pennsylvanian 10,270 ft., Strawn 10,338 ft., Silurian 10,920 ft., Fusselman 11,040 ft., Simpson 11,240 ft., Ellenburger 11,630 ft., elevation 2,235 ft., had good blow of gas on DST at 9,390-9,473 ft., no shows of oil.

Ector County: J. C. Barnes 1 J. W. Buchanan, SW SW 15-45-T2S-T&P, 5½ mi. NW Penwell Ellenburger field, dry, TD 6,339 ft., Glorietta 5,100 ft., Tubbs 6,035 ft., elevation 3,021 ft.

Lynn County: Sinclair Oil & Gas Co. 1 G. C. Lindley, SE SW 47-8-EL&RR, 1 mi. N O'Donnell, dry, TD 10,777 ft., San Andres 3,890 ft., Pennsylavnian 9,421 ft., elevatio 3,050 ft., no shows.

Pecos County: Hunt Oil Co. 7 Elsinore Royalty Co., 1-D-GS&SF, 9 mi. SE Chancellor, dry, TD 1,920 ft.

Yoakum County: Amerada Petroleum Corp. 1 C. E. Turrentine, SE SE 41-K-PSL, 3 mi. SW Tokyo dry, TD 7,920 ft., base San Andres 6,615 ft., no shows.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Donley County: Humble Oil & Refining Co. 1 J. Roach, 5-C4-GC&SF, dry, TD 5,265 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—McAlester Fuel Co.'s 1-A Denton, Lea County wildcat 12 miles northeast of Lovington field in 11-15s-37e, reported recovery of oil and gas on three drill-stem tests in Permian dolomite, tentatively identified as Wolfcamp.

Tested from 9,038-9,150 ft., for 3 hours and 30 minutes, gas came to the surface in 1 hour and recovery was 1,710 ft. of 38°-gravity oil, 1,170 ft. of heavily oil and gas-cut mud, which was estimated to be 80 per cent oil, and no water. Second test, from 9,149-96 ft., had gas in 27 minutes and recovered 3,200 ft. of clean oil, plus 210 ft. of heavily oil and gas-cut mud. Length of test was 3 hours and 45 minutes.

Last reported test was open 2 hours, in white dolomite from 9,500-36 ft. Gas showed in 14 minutes and produced a strong blow. Recovery was 3,485 ft. of oil, of which the bottom 800 ft. contained a small amount of sediment. Open flowing pressure was 900 psi., and bottom-hole pressure was 2,500 psi. in 15 minutes. Operators were coring ahead below 9,591 ft.

Stanolind Oil & Gas Co. 1 Federal-Leonard, 11-26s-37e, 5 miles southeast of Jal, ran a 1-hour drill-stem test at 11,360-413 ft., which recovered 150 ft. of drilling mud with no shows. A second test from 11,412-484 ft. recovered 65 ft. of mud with no shows. Operators drilled to 11,560 ft. and prepared for another test. On elevation of 3,013 ft., top of the McKee sand was 11,385 ft.

Amerada Petroleum Corp. 1 Stella Bennett Rose, SE NW 35-16s-38e, north offset to its 1 Hamilton, Devonian discovery, was drilling in dolomite at 10,677 ft. in new hole.

SOUTHEASTERN NEW MEXICO WILDCAT FAILURES

Lea County: Amerada Petroleum Corp. 1-CA State, SE SE 9-10s-36e, dry, TD 13,123 ft., PB 4,160 ft., San Andres 4,140 ft., Glorietta 5,620 ft., Abo 7,720 ft., Wolfcamp 8,845 ft., Pennsylvanian 9,315 ft., Mississippian 11,660 ft., Devonian 12,329 ft., elevation 4,030 ft.

Mid-Continent Petroleum Corp. 1-A State, NE NE 16-10s-36e, S offset to Amerada 1-CA State, dry, TD 7,198 ft., San Andres 4,120 ft., Glorietta 5,610 ft., Clear Fork 6,040 ft., elevation 4,024 ft.

LEGAL

ADDITIONAL TRIBAL INDIAN LANDS BEING ADVERTISED: Notice has been posted that 14,572.97 acres of additional Tribal Indian lands have been offered for sale, bids on which will be opened August 9, 1949, at 2:00 P.M., at the Uintah & Ouray Agency office, Fort Duchesne, Utah. The acreage being offered is located in Township 4 South, Ranges 4, 5, 6 and 7 West, USBM, State of Utah. Full particulars, with exact description of acreage may be obtained from the Uintah and Ouray Agency, Fort Duchesne, Utah, or the U. S. Geological Survey, Casper, Wyoming.

LEGAL

16,808.82 acres of Tribal Indian lands located in Township 1, North, Range 2, West; 1 North, 3 West; 1 South, 2 West; 1 South, 3 West; 1 South, 1 West; 1 South, 2 West; in the Uintah and Ouray Reservation Utah, are being advertised for lease, bids on which will be opened August 4, 1949, at 2:00 P.M., at the office of Forrest R. Stone, Superintendent of the Uintah and Ouray Indian Agency, Fort Duchesne, Utah. Full descriptions, and copies of advertisement may be obtained from Superintendent Stone or from Supervisor J. R. Schwabrow, U. S. Geological Survey, Federal Building, Casper, Wyo.

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OHIO, KENTUCKY

Erie County Wildcat To Test Sub-Trenton

COLUMBUS.—The Sentinel Enterprise Co. has landed the surface pipe and first string of casing on a wildcat on the William Mack Tract in Section 3, Oxford Township, Erie County. The well is to test the St. Peter and sub-Trenton formations, and is on a high as determined from core tests on top of the Trenton.

Oxford Oil 5 Rambo, Section 26, York Township, Morgan County, a north offset to the big 1-C Gibbs, found the Clinton at 3,841-77 ft. with a fair show of oil, and the Medina sand dry. The hole will be plugged back to the Clinton and shot.

Grim Brothers 1 W. G. Williams, Section 19, Lodi Township, Athens County, topped the first Berea sand at 1,416 ft. and finished at 1,426 ft. with 1,750,000 cu. ft. of gas natural, and with a rock pressure of 560 psi.

E. A. Fierbaugh et al 1 John Duta, Lot 3, Ruggles Township, Ashland County, a wildcat west of Ashland field, found broken and dry Clinton at 2,106-13 ft. The well was drilled to 2,220 ft. and plugged.

Shuff & Bucy 1 Gladys Elliott, Lot 7, Clay Township, Knox County, a semi-wildcat west of Bladensburg pool, had only a show of gas in the Clinton at 2,718-47 ft. and was plugged.

EASTERN KENTUCKY

ASHLAND.—In Owsley County, location has been made for the first St. Peter-Knox test for this east central part of Kentucky. The well is Petroleum Exploration Co. 1 B. Bottner, 9-L-69, at the town of Vincent and 5½ miles west of Booneville, the county seat. It will be drilled with cable tools.

In Furnace gas field of southern Powell and northern Estill counties, Petroleum Exploration Co. is drilling at 1,357 ft., on 1 McIntosh, 500 ft. southwest of Garrett 3 "A," which was the pool discovery.

In western Lewis County, 4-Y-72, H. P. Purnell et al are drilling at 478 ft. on 1 C. F. Ferguson, some 13 miles west of Vanceburg and 2½ miles northeast of the small hamlet of Tollesboro. The well may test part of the Knox sequence in that area.

EASTERN KENTUCKY SUCCESSFUL WILDCAT

Breathitt County: Caputo & Epperson 1 Burl Cundiff, 16-N-74, IP 15 bbl., Corniferous lime, TD 1,528 ft.

EASTERN KENTUCKY WILDCAT FAILURE

Lawrence County: Compton & Long 1 Martha Wilson, 1-T-80, dry, TD 2,770 ft., Big lime 800 ft., Berea 1,419 ft., Devonian black shale 1,540 ft., Corniferous 2,128 ft., Big Six 2,703 ft., no shows.

WESTERN KENTUCKY

OWENSBORO.—A new pool apparently has been established by Sun Oil Co. in its 1-B John Reburn, 22-O-19, a mile southwest of the Morganfield pool, Union County, which swabbed at the rate of 6 bbl. per hour on initial production tests from Cypress sand at 2,267-91 ft. This is the first Cypress production in the Morganfield area. Pay was given a 40-quart shot. Pumping equipment is being installed.

North of the Birk City pool in Daviess County, O. D. Vickers and Shaw Drilling Co. 1 Bell, 9-P-27, has 200 ft. of oil and 700 ft. of water in the hole after drilling 6 ft. in the Jack sand, topped at 1,494 ft., (elevation 381 ft.).

In the Nantz area, Daviess County, C. E. Skiles got a good well in his 4 Kelly, 8-Q-31, completed as a 112-bbl. pumper from Cypress sand at 1,042-52 ft., shot with 20 quarts.

In the new northeast extension area of the Pellville field, Daviess County, H. H. Vickers and associates 1 Cecil heirs, 16-P-33, is bailing ¼ bbl. of oil per hour while cleaning out and testing Tar Springs sand at 515-36 ft. Pay was shot with 30 quarts.

WESTERN KENTUCKY WILDCAT FAILURES

Henderson County: Basin Drilling Co. and Al Marcel 1 Dempewolf, SW NW SE 10-Q-24, dry, TD 2,540 ft.

INDIANA

EVANSVILLE.—New development on the south side of the North Owensville field in Gibson County has resulted in another good producer with the completion by W. A. Schuller of his 1 Clarence Anderson, SE NE NE 30-2s-11w, as a 250-bbl. pumper from the Benoist sand at 2,144-64 ft. Pay was shot with 20 quarts.

In the northwest end of the Wheeling pool, in the same county, George Wrather has completed his 1 Armstrong, SE NE SE 7-1s-9w, making 38 bbl. per day on the pump from the Benoist at 1,702-10 ft. It was shot with 60 quarts. His 1 Ray White, NE NE SE 7-1s-9w, a 10-acre location north, found saturation in a Pennsylvanian sand at 1,110-20 ft., and will be completed in that pay. In a drill-stem test of this sand, a recovery of 180 ft. of clean oil and 30 ft. of oil-cut mud was made.

Barron Kidd 2 Sanders, SE SE NE 31-5s-13w, north side of the Springfield field, Posey County, where some new development has been undertaken recently, is pumping 15 bbl. per day from the Waltersburg sand at 2,130-34 ft. after a 30-quart shot. Rush Creek Oil Co. 1-B Barrett, NE SE NE 27-5s-14w, an edge well for the New Harmony South pool, same county, made a 60-bbl. pumper from Pennsylvanian sand at 1,394-1,410 ft.

The new area on the east side of the Mount Carmel pool in Knox County also recorded another good completion in Carter Oil Co. 8 Steckler, NW SW SW 13-1s-12w, good for 87 bbl. per day on the pump. Production is from both the Hardinsburg at 1,806-25 ft. and the Benoist at 2,078-83 ft.

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INDIANA WILDCAT FAILURES

Gibson County: Olds Oil Co. 1 McClure, SW SE NE 30-2s-9w, dry, TD 1,891 ft.

Knox County: Frank J. Ellison 1 Richter, NE NE SW 20-5n-7w, dry, TD 2,363 ft. Walter W. Tolar-Walter Duncan 1 Blann, SE SE NW 15-5n-9w, dry, TD 2,850 ft.

Posey County: Walker & Walker 1 Joe Wolf, NE SE NE 27-6s-12w, dry, TD 2,776 ft.

ILLINOIS

Franklin County Wildcat Proves New Pool Opener

MATTOON.—Producers Pipe Line Co. 1 King, NW NW SW 16-5s-4e, Franklin County, which on a previously reported drill-stem test gave indications of opening a new pool, swabbed at the rate of 8 bbl. of clean oil per hour on initial production tests. It is in the O'Hara lime at 3,056-62 ft. with total depth at 3,063 ft. and 7-in. casing at 3,052 ft. Pay was given a 1,000-gal. acid treatment. Location is 5 miles east of Ewing. Nearest production is in the Ewing pool, 8 miles northwest.

In Marion County, interest is centered on the area 4 miles north of Centralia between the Salem and old Brown pools where The Texas Co. 1 Frank-Meyer Unit, NE SW SE 3-1n-1e, swabbed at the rate of 200 bbl. per day in production tests of the Rosiclare at 1,924-34 ft. and the McClosky at 1,950-58 ft. The well, now being put on the pump, is 3 miles from the Brown pool, the nearest production. The latter production is from Cypress sand. Both the Cypress sand at 1,640-72 ft. and the Benoist sand at 1,764-80 ft. also carried saturation in The Texas Co. well.

Devonian production in the rapidly developing Assumption pool in Christian County, has been extended another ¾ mile southeastward. Harry R. Lippitt 1 Cramer, NE NW SW 15-13n-1e, the extension well, flowed 75 bbl. per hour initially and continues to make about 20 bbl. per hour with pay at 2,311-13 ft. Prior to testing, the zone was treated with 5,000 gal. of acid. Total depth is 2,331 ft. with casing at 2,311 ft., top of the Devonian.

C. E. Skiles 1 Abell, NW SW SW 14-8s-9e, Gallatin County, which is opening a new Cypress sand pool in the triangular area between the Inman, North Inman, and West Inman pools, swabbed 4 bbl. per hour on tests after the pay was shot, and is being put on the pump. Sand is at 2,508-14 ft. with total depth of hole at 2,517 ft. The well is 1¼ miles from production of the Inman pool.

West of the North Junction pool in Gallatin County, Skiles still is testing his 1 McCormick, SE SE SW 4-9s-9e, which is opening new production in a Pennsylvanian sand at 996-1,007 ft. In the meantime, his 2 McCormick, a twin to No. 1, has found saturation in a second and slightly lower Pennsylvanian sand at 1,130-45 ft., from which 125 ft. of clean oil and 90 ft. of oil-cut mud was recovered in a drill-stem test. Operators deepend the hole to 2,000 ft. but have plugged back to the base of saturation for completion of the well. No. 1 swabbed at the rate of 1 bbl. per hour on initial tests.

ILLINOIS SUCCESSFUL WILDCAT

Edgar County: W. Henigman 1-A Waller, SE SW SW 3-13n-13w, IP 105 bbl., Pennsylvanian 308-24 ft., TD 324 ft.

ILLINOIS WILDCAT FAILURES

Bond County: Hoiles Petroleum Co. 1 White-Hoiles, NW NE NE 23-4n-3w, dry, TD 1,160 ft.

Christian County: Walter Koelbel 1 Meyers, SW NE SE 19-3n-1w, dry, TD 2,303 ft.

Clinton County: E. A. Abering 1 Bond est., NW SE NW 6-2n-2w, dry, TD 1,404 ft.

Murphy & Goldsmith 1 Schlaffy, NE SW NW 19-2n-2w, dry, TD 1,247 ft.

Jasper County: W. J. Straker 1 J. Achs, SE SW SE 32-6n-14w, dry, TD 2,881 ft.

Lawrence County: W. A. Tolar 1 A. C. Smith, C NW SE 34-4n-11w, dry, TD 664 ft.

Randolph County: Kiebleker-Schnetzmeyer 1 A. B. McMillan Heirs, NE NE SE 7-5s-5w, dry, TD 140 ft. (junked hole).

Richland County: Don Brines et al 1 Coen, SW SW NW 20-3n-10e, dry, TD 3,178 ft.

Shelby County: Doran et al 1 Flaherty, NW NW NE 34-13n-2e, dry, TD 1,600 ft.

Washington County: National Associated 1 Rabe, NW SE NW 13-3s-4w, dry, TD 3,759 ft.

MICHIGAN

North Limit Defined For New Field

MOUNT PLEASANT.—Just over ½ mile north of the Bard Dundee field, Gladwin County, Top O'Michigan Development Co. 1 George, SW SW NW 31-18n-2w, Grout Township, was bottomed out dry in the Dundee objective at 4,020 ft. Top of this objective was logged at 3,988 ft., and the well was reported to be 29 ft. lower on the Dundee than the producing wells to the south. This was the first dry hole barrier to be drilled in this field. Two producers were completed following the discovery well drilled by W. L. McClanahan.

Three more dry tests were added in the Freeport-Carlton play, Barry County, bringing the total number of failures in this district to four, while one other close-in development test to the lone discovery producer was being completed in the Traverse and was unofficially reported to have been bottomed out dry late this week.

NOTICE TO ALL OIL COMPANIES

The California Division of Fish and Game has opened, for seismic explorations, that portion of the coast lying between Point Conception and the northern limits of the city of Santa Barbara, known as Area 7, for a period of ninety days beginning August 1, 1949, and the areas around Santa Barbara, San Clemente and San Nicolas islands, known as areas 13, 14 and 15, respectively, for a period of ninety days beginning July 1, 1949. These areas will not be opened again prior to January 1, 1952.

Explorations in each area will be carried out jointly by several companies. Any oil company wishing to participate in the joint explorations in any of the above areas must so notify

Mr. J. B. Hudson
Humble Oil and Refining Company
612 South Flower Street
Los Angeles 14, California

on or before July 24, 1949. No request for participation in the work will be considered if the application has not been received prior to midnight, July 24, 1949.

Signed
R. S. Croker, Chief
Bureau Marine Fisheries
June 24, 1949

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THE OIL AND GAS JOURNAL
TULSA 1, OKLAHOMA

Hope for a possible northeast extension of Mears Dundee field, Oceana County, faded as McClanahan Oil Co. and George F. Herr drilled out dry on the 1 Kitchen, SW SW SW 26-15n-18w, Golden Township. Dundee top was logged at 2,198 ft. and hole was bottomed out at 2,214 ft. There have been three oil wells and four dry holes drilled in the area. The discovery producer, one of the three producers in the pool, was completed in February.

In Allegan County, Ohio Oil Co. A-1 U. S. of America, NW NW NW 31-2n-14w, Valley Township, diagonal southeast offset to Ohio's small Traverse oil discovery in Clyde Township, was bottomed out dry in the Traverse at a total depth of 1,320 ft., after top of objective lime was picked at 1,298 ft. This is the first test, classified as a wildcat, to follow Ohio's discovery in the area.

All operations in the state were not disappointing. Gulf Refining Co. added another good Dundee producer in Sylvan pool, Osceola County; Norman L. Stevens completed another good Traverse oil well in Lee field, Allegan County; and other successful field completions were noted in Stony Lake, Pentwater, and Kawkawlin fields.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Norman L. Stevens 1 South Haven Chemical Co., SW SE NE 26-1n-16w, Traverse 1,131 ft., dry, TD 1,148 ft.

Valley Township: Ohio Oil Co. A-1 U. S. A. NW NW NW 31-2n-14w, Traverse 1,298 ft., dry, TD 1,320 ft.

Ionia County, Campbell Township: Mercer Oil Co., Inc., 1 Kauffman, SE SE NE 29-5n-8w, Traverse 2,134 ft., dry, TD 2,188 ft.

Isabella County, Nottawa Township: Merrill Drilling Co. 1 Finnerty, SE NE SW 12-15n-5w, Dundee 3,791 ft., dry, TD 3,810 ft.

Kent County, Caledonia Township: Gortsema & Meyer 1 Sundbye et al, SE NE NE 27-5n-10w, Traverse 1,922 ft., dry, TD 1,977 ft.

in Devonian in one of the wells, and the zone is being tested. Following the extensive lease play throughout North Dakota, it is reported, but not confirmed, that stratigraphic drilling will be done on several blocks during this year.

Failure to make commercial producers on two sides of Church Buttes field, Sweetwater and Uinta counties, Wyoming, apparently has defined productive limits of the field in these areas. The wells are Mountain Fuel Supply Co.'s 5 Unit, 1½ miles northeast of the pool opener, and 6 Unit, 1½ miles southwest of the discovery well. These wells were drilled to the Dakota at around 13,000 ft. and reportedly found the sand hard and tight. Mountain Fuel is pulling casing on their 6 Unit, and will reportedly rework 5 Unit in an effort to make a producer of the well. The Church Buttes field has been regarded as one of the most important gas reserves in the Rocky Mountain region, following discovery of gas and condensate in the first well in 1946.

Superior Oil Co. is still reported testing at 1 Unit, SW NE SW 27-27n-103w, Pacific Creek, Sublette County, Wyoming. The well is at 20,521 ft., total depth, the world's deepest well, and for the past 10 days the operator has been reported testing below 7-in. casing cemented at 19,765 ft. Results of tests, and formations encountered, have not been reported by Superior. It is rumored, but not confirmed, that the company may deepen this well below its present depth, if testing is not successful.

British-American Oil Producing Co. is completing the Clark Fork wildcat, 1 Government-McClellan, C NE NE 26-9s-22e, Carbon County, Montana, as a gas-condensate discovery in the Dakota sand. The well was drilled into the Madison at 9,446 ft., total depth, and was plugged back for tests in the Phosphoria but this zone was not commercial. Production is between 7,548-60 ft., with a gage of approximately 1,160,000

(Continued on page 160)

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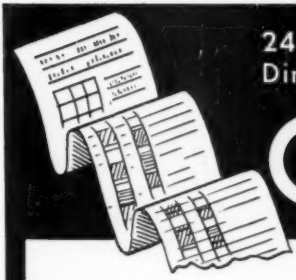
ROCKY MOUNTAIN

Exploration Increases In Rocky Mountain Area

DENVER.—Although development drilling, particularly in black oil fields, has slowed throughout the Rocky Mountains, exploratory drilling has definitely increased in all districts of the region. During the current week, two new wildcats were announced for western Nebraska, where Ohio Oil Co. is still testing on a new discovery. Frontier Refining Co. of Denver and Roberts Brothers of Shreveport, La., have now made locations for wildcat tests in Cheyenne County, near the Ohio Gurley discovery well. Carter Oil Co. and Stanolind Oil & Gas Co. are considering another deep test near their Roosevelt discovery, Uintah County, Utah, and lease sale on two additional Indian areas near Roosevelt have been announced by the Uintah Tribal Superintendent. Tide Water Associated Oil Co. will soon start a wildcat north of Roosevelt and northwest of the town of Vernal. Pure Oil Co. has completed a deal with General Petroleum Corp. for a wildcat test of the West Douglas Creek block, Rio Blanca County, Colorado, where General Petroleum drilled a Weber sand failure a year ago. In Wyoming there are now more wildcat wells being drilled than a year ago, and four recent discoveries have been made. American Liberty Oil Co. of Dallas is moving in tools for a wildcat south of Sussex field, Johnson County, where Continental Oil Co. recently made two discoveries. George G. Travis of Tulsa is now starting a wildcat to Devonian in the Ramshorn area, Teton County, on a block farmed out from Sinclair Oil & Gas Co. Several important Devonian tests are being drilled, and are planned, for the central and northwestern part of Montana. Staining has been found



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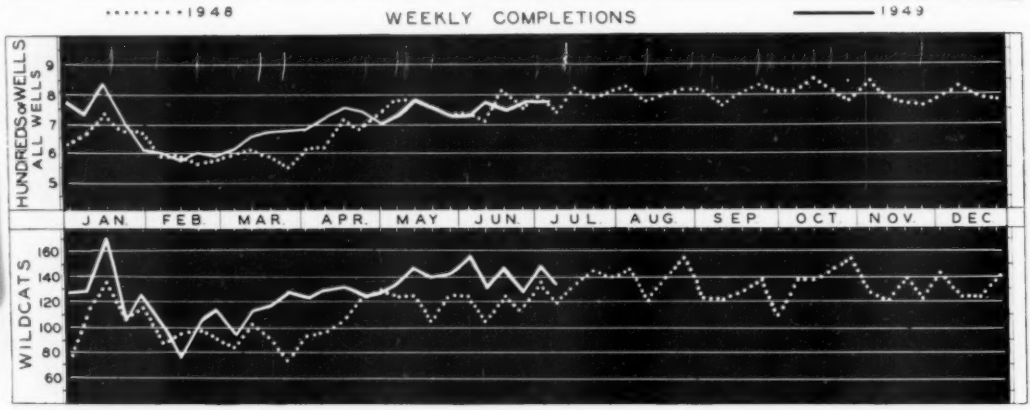
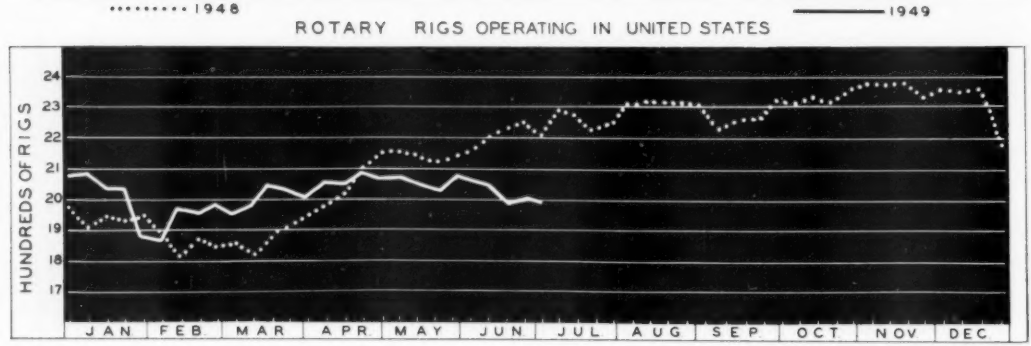
WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED JULY 9, 1949

	Total of all wells					27 wk.		Wildcat completions and discoveries					Cumulative total, 1949				
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	12	6	0	*6	13,544	571	780	0	0	0	0	0	0	0	0	0	0
Pennsylvania	18	6	4	*8	38,749	825	1,340	0	0	0	0	0	0	0	1	1	2
West Virginia	10	4	5	1	14,307	250	402	0	0	0	0	0	1	0	6	6	13
Ohio	25	10	7	†8	47,161	543	673	0	0	0	0	0	1	0	2	19	22
Indiana	27	8	1	18	48,197	619	503	0	0	0	4	4	12	0	0	120	132
Kentucky	21	9	1	11	29,494	445	325	1	0	0	2	3	10	0	0	32	42
Illinois	51	31	0	20	117,986	1,205	1,080	1	0	0	10	11	27	0	1	196	224
Michigan	21	7	0	†14	43,176	489	374	0	0	0	5	5	19	0	1	158	178
Kansas	76	29	25	22	227,070	1,553	1,499	1	0	0	8	9	32	0	4	199	235
Neb., Mo., Iowa	0	0	0	0	0	*12	2	0	0	0	0	0	0	0	0	*8	*8
Oklahoma	82	48	1	33	284,497	2,155	2,020	5	0	0	9	14	80	9	10	304	403
Texas	284	184	17	83	1,199,045	6,890	5,732	8	1	5	37	51	207	30	63	1,190	1,490
North Central (Dist. 7-B & 9)	71	38	1	§32	206,168	2,228	1,765	3	0	1	13	17	89	0	10	464	563
West (Dist. 7-C & 8)	71	62	0	9	357,597	1,655	1,548	1	0	0	6	7	29	0	2	139	170
Panhandle (Dist. 10)	42	31	9	2	125,735	554	297	0	0	0	1	1	1	0	0	3	4
Eastern (Dist. 5, 6, & 6-P)	15	7	2	6	82,903	352	266	0	0	0	3	3	3	2	3	74	82
Gulf Coast (Dist. 2 & 3)	43	26	1	16	241,528	1,034	926	2	1	1	4	8	46	22	29	202	299
Southwest (Dist. 1 & 4)	42	20	4	18	185,114	1,067	930	2	0	3	10	15	39	6	19	308	372
Louisiana	53	36	4	13	246,271	1,065	1,070	2	0	0	5	7	30	10	3	107	150
Northern	38	26	4	8	119,936	576	704	0	0	0	3	3	1	2	0	46	49
Southern	15	10	0	5	126,335	489	366	2	0	0	2	4	29	8	3	61	101
Arkansas	10	6	0	4	39,136	154	137	0	0	0	2	2	2	0	0	30	32
Mississippi	9	4	0	5	55,152	187	193	0	0	0	2	2	4	0	1	54	59
Southeastern States	1	0	0	1	2,929	24	25	0	0	0	1	1	1	0	0	21	22
Montana	3	1	0	2	11,002	113	126	0	0	0	1	1	1	0	1	17	19
Wyoming	18	7	0	11	87,698	305	236	3	0	0	3	6	16	0	0	54	70
Colorado-Utah	3	0	0	3	18,710	67	126	0	0	0	3	3	1	0	0	28	29
New Mexico	10	5	1	4	46,193	280	315	0	0	0	2	2	6	0	0	28	34
California	54	41	2	11	266,119	1,404	1,454	1	0	2	10	13	26	0	5	239	270
Total United States	788	442	68	278	2,836,436	19,856	18,412	22	1	7	104	134	476	49	98	2,811	3,434
Total previous week	810	447	56	307	3,016,971*	18,368	17,672	28	1	4	124	157	454	48	91*	2,707*	3,300
Total July 10, 1948	740	398	59	283	2,599,671			25	0	4	91	120	412	36	139	2,417	3,004

Service wells included: *6, †2, 13, §1. *Revised.





DAILY AVERAGE PRODUCTION FOR WEEK

	July 9 crude oil	B. of M. June demand	July 2 crude oil
Alabama	1,200	1,550	1,150
Arkansas	72,600	86,000	72,500
California	914,200	940,000	918,350
Colorado	65,750	65,000	63,900
Eastern	61,600	60,850	58,100
Florida	1,425	1,400	1,425
Illinois	179,700	165,000	179,400
Indiana	24,200	23,000	25,800
Kansas	245,950	300,000	278,150
Kentucky	23,200	21,000	23,300
Louisiana	474,050	487,000	489,475
North Louisiana	106,000		105,750
South Louisiana	368,050		383,725
Michigan	39,700	46,000	39,700
Mississippi	91,950	114,000	100,400
Montana	28,500	24,000	29,200
Nebraska	600	700	600
New Mexico	136,300	126,000	137,450
Oklahoma	386,300	405,000	394,600
Texas	1,805,000	2,210,000	1,878,575
Dist. 1 (Southwest)	25,570		25,950
Dist. 2 (Southwest)	108,825		116,050
Dist. 4 (Southwest)	174,675		182,575
Dist. 3 (Gulf Coast)	334,905		349,575
Dist. 5 (Eastern)	32,150		33,725
Dist. 6 (Eastern)	78,700		81,950
East Texas field	221,000		236,425
Dist. 7-C (West)	41,425		41,950
Dist. 8 (West)	499,375		520,675
Dist. 7-B (W. Central)	57,400		59,225
Dist. 9 (N. Central)	137,175		137,250
Dist. 10 (Panhandle)	93,800		93,225
Utah	850	500	850
Wyoming	127,800	123,000	130,400
Total United States	*4,680,875	5,200,000	4,823,325
Change from prev. week, down	142,450		
Canada	57,590		59,135
Total U. S. production January 1-July 9			†981,157,720 bbl.
Same period last year (crude plus cond.)			1,043,456,775 bbl.

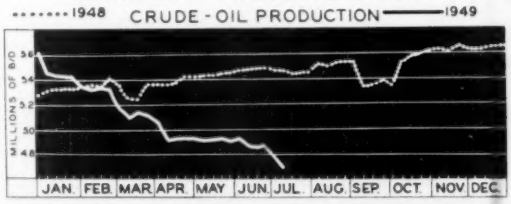
*Not including 78,930 bbl. condensate. †Including 15,879,160 bbl. condensate.

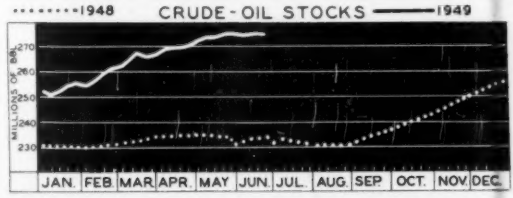
CRUDE STOCKS BY STATES OF ORIGIN

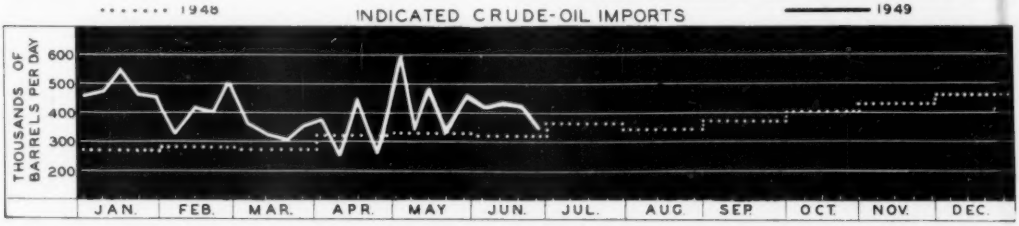
(Thousands of barrels)

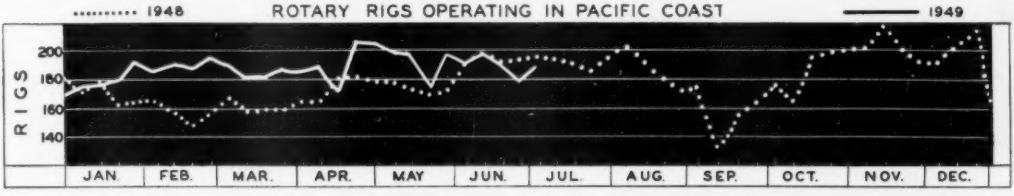
State of origin—	June 25, 1949	June 18, 1949	June 26, 1948
Pennsylvania Grade	2,954	3,004	2,704
Other Appalachian	2,101	2,067	756
Ill., Ind., Mich.	14,384	14,391	10,869
Arkansas	2,926	3,002	2,649
Louisiana	15,076	14,980	11,689
North	3,288	3,339	3,014
Gulf	11,788	11,641	8,675
Mississippi	3,318	3,277	2,776
New Mexico	7,634	7,795	4,987
Oklahoma and Kansas	40,492	40,402	34,763
Texas	128,674	128,782	113,634
East Texas	17,505	17,934	16,395
West Texas	51,439	51,368	42,981
Texas Gulf	30,037	30,247	29,049
Other Texas	29,693	29,233	25,209
Rocky Mountain	14,078	14,233	9,111
California	34,619	34,877	30,166
Foreign	7,858	8,146	5,528
Total United States	274,114	274,956	229,632

(Data for July 2 not available at press time)







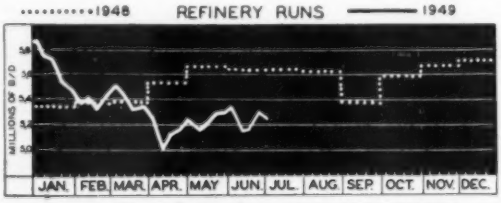


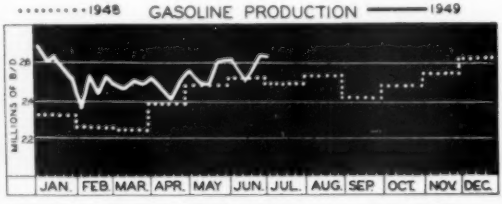
Refining Statistics

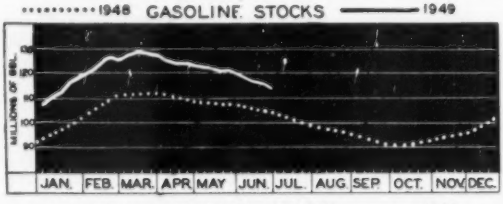
A.P.I. REFINERY REPORT, JULY 2
(Thousands of barrels)

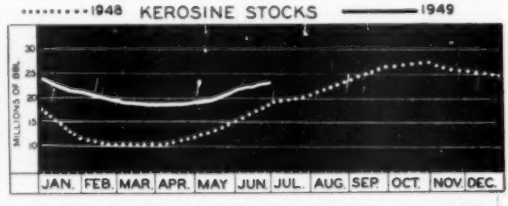
District—	Crude runs daily avg.	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, July 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production			
											Gasoline*	Kerosine	Distillate	Residual
East Coast	676	295.3	31.1	108.6	154.0	27,080	9,750	21,555	9,825	891	320.7	43.5	170.6	222.6
Appalachian:														
District 1	96	41.3	3.7	9.6	7.6	2,554	407	688	498	93	40.0	4.8	12.1	11.1
District 2	65	35.3	1.0	7.4	13.1	1,108	162	197	278	36	15.5	1.1	4.6	10.0
Ind., Ill., Ky.	848	488.0	40.0	104.1	125.6	24,706	3,930	9,918	5,367	932	491.5	52.0	128.0	154.7
Okla., Kans., Mo.	440	238.7	17.9	79.9	56.9	11,251	1,451	4,875	2,445	483	246.2	22.8	87.0	79.0
Inland Texas	242	155.6	12.4	21.4	49.3	4,179	578	848	1,196	248	144.8	8.2	31.0	60.2
Texas Gulf Coast	1,264	669.3	65.3	184.4	230.0	15,267	3,677	10,095	7,852	1,395	601.5	102.8	295.2	259.9
La. Gulf Coast	395	217.4	31.1	86.1	43.0	5,612	2,106	4,081	2,078	435	185.5	45.1	92.7	77.9
N. La. and Ark.	70	27.7	5.3	7.3	14.4	2,673	452	992	241	84	30.5	7.5	12.2	19.5
Rocky Mountain:														
New Mexico	11	5.9		1.9	2.9	59	25	76	30	12	6.0	0.4	1.7	3.6
Other Rocky Mtn.	172	77.0	6.3	31.4	31.1	3,062	312	1,433	925	151	61.3	3.9	24.0	28.9
California	962	391.1	10.7	135.0	376.8	16,449	767	9,829	35,004	871	351.4	12.5	135.1	336.4
July 2, 1949‡	5,241	2,642.6	224.8	777.1	1,104.7	114,000	23,617	64,587	65,741	5,631	2,494.9	304.6	994.2	1,263.8
June 25, 1949	5,322	2,637.4	236.9	735.4	1,122.3	115,715	23,313	63,049	66,146					

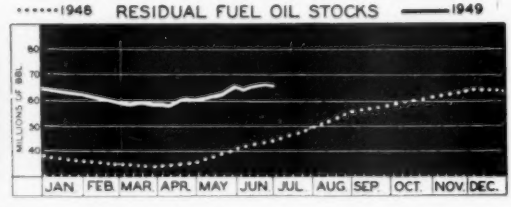
*At refineries including natural blended. †Finished and unfinished. ‡Comparable data for 1948 on new basis not available.



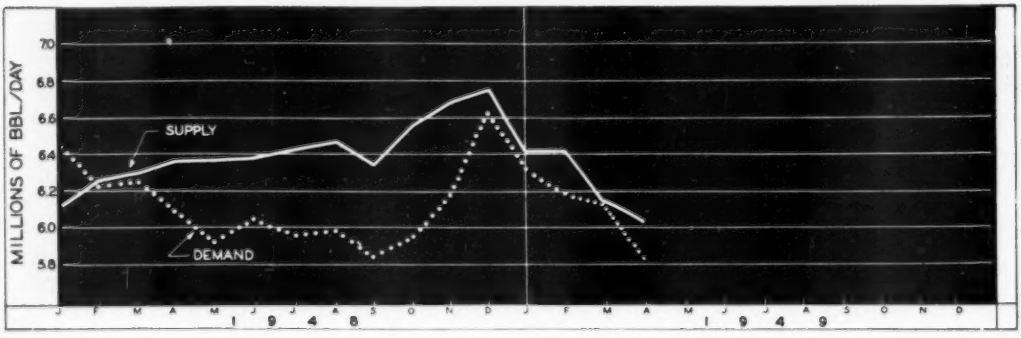








PETROLEUM SUPPLY AND DEMAND



CRUDE PRICES
GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.40
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°, †35° and above

SUMMER sales of distillates and kerosine continue as the big problem for refiners. Since the end of last heating season both resellers and consumers have stayed out of the market, resulting in continued above-normal increases in primary stocks in spite of decreased refinery yields. The supplier now has two major problems: what to do with the current surplus supply of distillate, and how to meet the expected increases in demand during the winter months.

Esso Standard Oil Co. added diesel fuels to the list of distillates and kerosine on which summer discounts will be allowed. In general, these discounts amount to 0.5 cent per gallon on sales to consumers while resellers will get discounts of 0.6 cent per gallon on July purchases and 0.5 cent per gallon on August deliveries.

Sun Oil Co., Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co. announced similar plans. In its notice to resellers, Socony-Vacuum estimated that demand for kerosine and heating oil along the East Coast for the 1949-50 heating season may exceed last season by 20 per cent, and that even if every tank is filled by fall refiners will have to manufacture home-heating oil and kerosine during the winter at a greater rate than at any time in the past.

Some suppliers feel that actual consumption will be at least 20 per cent above last winter, and unless resellers and consumers fill their tanks before the season starts deliveries from primary storage will be even greater.

For the week ended July 2, decreases in gasoline and residual stocks exceeded the increases for kerosine and distillate to give a reduction of 278,000 bbl. stocks of major products.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of July 11, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9⅝-9⅞	11-11.5	9½-10
Premium gasoline, 78-80 octane	10¾-11	12-12.5	10½-11
42-44 w.w. kerosine	8-8½	7.5-8.4	7.50-8
No. 2 straw fuel oil	6½-7	6.5-7.4	6⅜-6½
No. 6 residual	$0.85-0.90	$1.60	$1.20-1.25

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5½	5	5¼
Grade 18-55	6.6	6	6.3

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

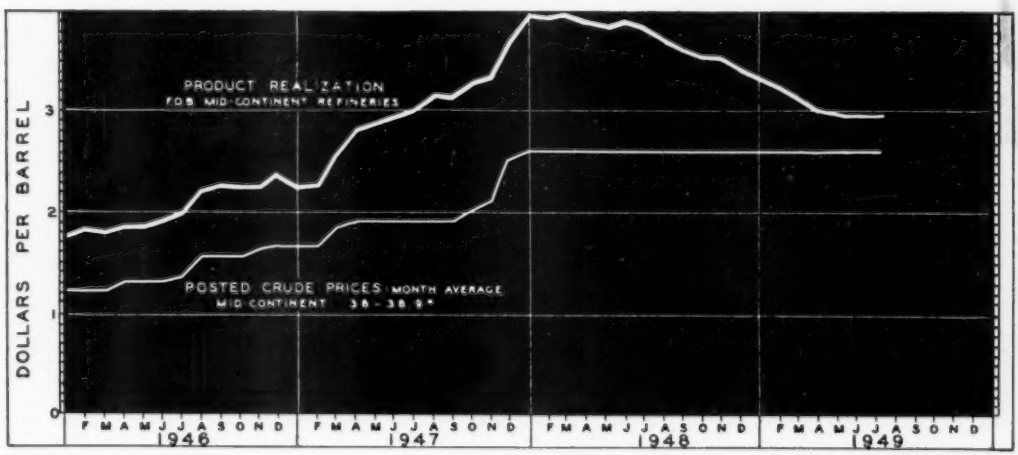
150-160 vis., D bright stock, 0-10 pp.	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	19.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.5



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

Congressmen Study Import Situation

(Continued from page 52)

portations of oil were a means of bettering world trade. I think it should be remembered that the income from the sale of foreign oil in our markets goes into the pockets of a few large oil companies in the United States.

"Outside of a small portion of each dollar paid for foreign oil that goes to the government where the oil is produced in the nature of royalty payments and incidental local labor the balance goes to New York, London, and Amsterdam to enlarge the already vast organization now importing oil.

"Our hope at this time is that Congress and those in the administration who do not favor the aggrandizement of the powers now concentrated in the importing group will realize the potentialities of a world oil monopoly and the danger to the United States economy and security. We hope to see established a limitation that does not depend upon the good will of the importing companies for its effectiveness."

Krug Minimizes Effect

There were other developments with respect to the import situation during the week, with Secretary of the Interior J. A. Krug minimizing the effects of imports while at the same time agreeing that "our national security depends largely upon the development of new domestic oil resources."

Krug expressed his views in a letter to Rep. Lindley Beckworth, commenting upon a resolution adopted by the Texas Legislature June 14.

The views in that resolution, he said, correspond in many respects with those of the Interior Department, "particularly the thought that imports of foreign oil will have reached a dangerous level when they might halt or seriously curtail the search for and development of oil in the United States."

But, he added, while current Texas production is substantially under last winter, the search for oil continues at a rate well ahead of last year and discoveries in the state, so far, are 59 per cent above a year ago.

Earlier in the week, too, Rep. Charles W. Vursell of Illinois charged that administration policies are throttling the domestic oil industry and demanded that the Government either stop emphasizing the importance of Middle East oil or consider putting enough military forces in that area to protect the properties.

In a bitter denunciation of what he termed "the long, carefully calculated program of a forceful element in the administration to debase the petroleum industry of the United States to a minor position," Vursell told the House that for 10 years the State Department and other agencies have been making our oil industry "subordinate to the foreign interests."

"The folly of putting so many eggs in that Middle East basket, looking at it from a national defense standpoint, as we look at everything these days," Vursell said, "is conceded by everybody, including our own military experts who have written off that area as a source of supply in the event of war with Russia.

"All the oil fields, refineries, and pipe lines could be seized in 2 or 3 hours and probably with little fighting. The owners would not have time to blow up the plants and junk the wells. The Russians would take them intact and begin supplying their own petroleum needs. The deficit in supply which they are now supposed to be suffering would be made up in a hurry."

Vursell asserted that the policies of both the present and preceding administrations have shown "a decided tendency" to depress and discourage continued exploration and development in this country.

"Had it not been for the unfortunate world war," he declared, "it is my opinion that such policies would have proved to be of great detriment to this most essential American industry. Unfortunately, the administration has not changed such a policy and shows no intention of a change for the future."

Congress declared itself in favor of developing the domestic industry when it imposed excise taxes on imported crude and products in 1932, Vursell said, but that action was largely nullified when the administration entered into a trade agreement with Venezuela in 1939 and cut the taxes in half.

"No remedy has been proposed by the administration to end the creeping paralysis which our domestic industry is now experiencing," he charged. "Instead, there have been declarations to the effect that the small duty now in effect on imports should be removed."

Vursell declared that the only remedy for the plight of domestic producers faced with further cutbacks in production is the plan proposed by Sen. Elmer Thomas of Oklahoma to limit imports of oil to a definite percentage of the national demand.

Texas Legislature May Turn to Oil, Gas Taxes

(Continued from page 54)

arded guess is that current omnibus tax schedules will be hiked by 10 or 15 per cent. Both oil and gas are covered by the omnibus tax.

One member of the legislature has suggested that state lands be sold to finance eleemosynary institutions, thus eliminating the need for new taxes. Even if this is done, some point out, the state may be faced with a large deficit because of declining revenue from oil-production taxes. Starting last January, the Railroad Commission has ordered seven consecutive cutbacks in Texas crude production. These cuts total around 965,000 bbl., or the equivalent of 40 per cent of the state's production on January 1 when the cuts were started. As a result of these allowable slashes, May receipts of production taxes were $6,215,160—$2,200,000 below last December. By July, the decline will be about $3,000,000 a month. An added factor is the ever-present possibility of a cut in the price of crude which would further reduce the state's income.

Tax Bills May Be Clue

A look at the oil and gas tax bills introduced and not passed this past session of the legislature may provide a clue as to possible tax measures in January. Two natural-gas tax bills were introduced early in the session. Rep. C. S. McClellan called for a production tax of 1 cent per 1,000 cu. ft. and Rep. Deno Tufares asked for a levy of 1½ cents per 1,000 cu. ft. of gas at the well head. A bill repealing the state's 4-cent-a-gallon retail gasoline tax and substituting a 1-cent-a-gallon processing tax on all combustible fuels was filed by Rep. Davis Clifton.

Three tax bills were introduced in the house just before the deadline for bill introduction. The first, House Bill 827 by Rep. Cloyd Young, provided for a sliding-scale levy on oil production with graduations ranging from 1.5 per cent to 8 per cent of market value. The lower limit would be for concerns or individuals having production of less than the 1,000 bbl. per month, while the upper limit would be for those producing 6,000,000 bbl. per month or more.

The second bill provided for a tax on gas gathering based on a sliding scale of prices. It proposed a tax of 1.5 cents per 1,000 cu. ft. for gas sold at not more than 5 cents per 1,000 cu. ft.; 2 cents in the 5-8 cents per 1,000 cu. ft. bracket; 2.5 cents for 8-10 cents price; and a ½ cent increase for each 4 cents increase in price above 10 cents per 1,000 cu. ft. The third bill was presented in event the omnibus tax schedules were hiked 10 per cent. Oil-production taxes would be raised from 4.125 per cent of value to 4.5375 per cent of value; gas-production taxes from 5.2 per cent of market value to 5.72 per cent; and on gas utilities, for towns of 1,000-2,500 population, a raise from 0.44 to 0.484 per cent of gross receipts, for 2,500 to 10,000 population, a raise from 0.81 to 0.891 per cent, and for towns over 10,000 from 1.5125 to 1.66375 per cent.

EQUIPMENT MEN . . . in the News

Krause and McMurry Get Garrett Promotions

B. F. KRAUSE

E. D. McMURRY

B. F. Krause has been appointed manager of the Gulf Coast division for Garrett Oil Tools, Inc. In his new position, Krause will be in charge of sales and service of gas-lift equipment in the Gulf Coast area. He will headquarter in Houston.

E. D. McMurry, former Gulf Coast manager, has been appointed special representative to work with all district and division representatives in designing installations and equipment to meet specific field and well conditions. He will also be in charge of the export division of the company, in which capacity he will make regular trips to South America and other areas where gas-lift equipment is in operation or applicable.

Announcement of the new appointments was made by H. U. Garrett, president of Garrett Oil Tools, Inc., Houston.

Guiberson Corp. Appoints Foreign Representative

Guiberson Corp. has announced the appointment of Daniels, Beckley & Associates, Inc., as foreign sales representatives for Guiberson oil-field equipment. The firm of foreign representatives is located at 30 Rockefeller Plaza, New York City.

New Ideco Store Opened at Lafayette

T. D. Collins, vice president, Ideco supply stores division, has announced the opening of a new Ideco oil-field supply store located at Lafayette, La. George Fox has been appointed store manager. This new installation will be operated under the direction of the Louisiana district manager, J. L. Morgan.

J. W. Terrell and Jimmie Norton, Ideco sales representatives, have been transferred to the Lafayette area and have established headquarters at the new supply store.

N. J. Herman, technical service engineer for International Derrick & Equipment Co., has been transferred to Tulsa.

Welex Makes Griffin Sales Manager of Houston Branch

W. H. GRIFFIN

W. H. (Bill) Griffin, well known among oil men for his work on oil-well completion problems, has been appointed sales manager of the Houston branch of Welex Jet Services, Inc., R. C. Armstrong, president, has announced. The Houston branch was opened in May.

Griffin has had 21 years of varied oil-field experience, including work with acidizing, plasticizing, dual completions, and cementing, and has prepared technical articles for the oil-industry press.

For the past 13 years, Griffin has been associated with Baker Oil Tools, Inc., in Houston. As Baker's division engineer and manager of export sales he worked on special production problems in Venezuela, Trinidad, Colombia, and Western Canada.

IPE Director Gets International Post

J. Burr Gibbons, one of the founders, former general manager, and 21-year director of the International Petroleum Exposition, was elected a world director of Rotary International at the recent international convention in New York. Gibbons is one of four American directors. The remaining six are from Argentina, France, England, Canada, Australia, and Switzerland. He is president of Gibbons Advertising Agency, Inc., Tulsa.

Staudt Named President of Tulsa Manufacturers Ass'n.

Tulsa Manufacturers Association has elected John G. Staudt, Dowell Incorporated, to direct this new group as president. Staudt is also a director of the organization and will act as chairman of the board.

Other officers elected are: Edward A. Thompson, Tulsa Winch Co., vice president; E. H. Gubser, Spartan Aircraft Co., treasurer; and Jacques

(Continued on page 159)

Seismograph Service Sends Instruments to Japan

Being loaded by U. S. Army Airforce, at Tinker Field, Oklahoma, is a part of two sets of portable seismic instruments sold by Seismograph Service Corp., Tulsa, to U. S. Army Engineers for petroleum exploration work in Japan. Horton Jenkins, a Seismograph Service Corp. observer, preceded the instruments to Japan to supervise placing the instruments in operation and to instruct Japanese crews in the use of the equipment

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FULLY equipped seismic recording unit, 12 traces, modern automatic amplifiers, Koenig built body. Shooting unit complete, good condition. For bargain write Box C-959, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 10,000 ft. 20" OD x ¼" Wall New Electric Weld Steel Pipe, Double Random Lengths; 50,000 ft. 18" OD x ¼" Wall Used Steel Pipe, Single Random Lengths. Utility & Industrial Supply Company, 921 Michigan Ave., E., Jackson, Michigan.

FOR SALE: Cardwell Model "RL" Spudder complete, Waukesha Motor, almost new lines, steel roof and floor, side curtains, new doghouse, two complete strings of tools, Koehler light plant, 1250 gal. Butane tank—now on location near Grayville, Illinois. Geo. H. Wickham, Box 595, Phone 149, Grayville, Illinois.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO
3415 Westminster, Dallas 5, Texas

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

CASING, RIGS, BELTS, TANKS, ENGINES: Everything for Cable Tool Drilling. Bought and sold. Tri-State Oil & Gas Company, Box 827, Phone 7-5121, Parkersburg, W. Va.

FOR SALE: THREE six ton Yale geared trolley-type rail hugger chain hoists, 15 foot lift. In good condition. Box C-979, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Model 953-DD-4000 Franks Double Drum Spudder, completely overhauled, double pole telescoping mast, skid mounted, with HxB Hercules Gas-Gasoline engine. No tools or wire lines. $7500 FOB Pampa, Texas. COCHRAN CONSTRUCTION CO., Box 1477, Phone 413, Pampa.

PRICED TO SELL, QUICK DELIVERY
New and Used Welded Steel Tanks and Tool House. New and Used Bolted Steel Tanks and Separators. 6—10 ft. X 35 ft. Gasoline Tanks. 8—2,000 Gal. Gasoline Tanks, mounted on Semitrailers with Pumps, etc. 1—37,500 bbl. Tank, with Floating Roof. Write Independent Tank Co., Box 102, Phone 977, Seminole, Okla.

NEW
FRACTIONATING TOWER
REFLUX DRUM

One (1) New fractionating tower, 5'-0" I.D. X 89'-6" over-all height X 1⅛" plate. Thirty-four (34) bubble trays, ten (10) 18"-300# manways. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

One (1) new horizontal reflux drum, 5'-6" I.D. x 18'-6" over-all length x 1⅛" plate. Stress relieved and built in accordance with API-ASME Code for 350 PSI working pressure.

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis St. Wichita, Kansas
Phone 7-3325

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection — Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE, at Birch Run, Michigan. #50 Oilwell geared power complete. 30 H.P. 2 cycle Type C Superior gas engine. #50 Oilwell belt tightener complete with shaft, bearings, and clutch. Circulating tank. 16' x 19' house. All in good condition. $2000 as it stands. Was used to pump twenty-five 1540' wells in field now abandoned. Smith Petroleum Company, 401 Keeler Building, Grand Rapids, Michigan.

ONE — 36L Bucyrus-Erie Spudder. New type and design, complete with steel dog house, Kohler Light Plant 1½KW, has 7" and 5" tools. (Note—This machine is in excellent condition). Priced $21,000.00. One New D7 Caterpillar Tractor, equipped with 8' LaPlante Choate inside bull-dozer, 3 speed, Hyster-winch. This tractor has less than 200 hours. Excellent shape. A. M. Perrine, P.O. Box 87, Salem, Illinois. Phone 1064 or 901W4.

ROTARY RIG, mounted on low-boy trailer; 45 foot telescoping A-mast, fold back; National rotary table; Oil Well mud pump; Kohler light plant; tool house; 1200 feet 4½" drill pipe; core barrel; overshot, etc., all that is necessary for drilling well. Just completed 2000 foot hole. Bargain for quick cash sale. Write Box C-1000, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW
A.P.I. CASING COUPLINGS

1,441—5½" O.D., 8 R. T. Long N-80
794—5½" O.D., 8 R.T. Short J-55
79—6⅝" O.D., 8 R.T. Long J-55
106—7" O.D., 8 R. T. Long J-55
144—7" O.D., 10-V Long J-55
15—8⅝" O.D., 8 R.T. Long J-55

ROCK ISLAND OIL & REFINING CO., INC.
335 West Lewis Street
Wichita, Kansas Telephone 7-3325

MODERN 7,500' RIG

FACTORY REBUILT WILSON "GIANT" DRAW WORKS
Powered By
THREE RECONDITIONED Le ROI ENGINES

Draw Works torn down, to bare skid, rebuilt to low streamlined silhouette, with greatly simplified controls. All worn bearings, clutches, chains, sprockets, etc., replaced. 500 hp. transmission. New hydromatic brake.

Balance of rig consists of 7¾-in x 18-in. pump and proper size units of popular makes. Including 6,500 ft. of excellent 4½-in. drill pipe with FH Tool Joints.

You will, indeed, be pleasantly surprised at the reasonable price and terms at which this complete rig is offered. Inquire for details.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

REFINERY

TO BE SOLD AT

PUBLIC AUCTION

- OWEN REFINERY at Hawley, Texas, 12 miles north of ABILENE, consists of TOPPING UNIT . . . CRACKING UNIT . . . TREATING TOWERS . . . FIRE EQUIPMENT . . . STORAGE . . . PUMPS, Centrifugal and Steam . . . INSTRUMENTS . . . CONTROL VALVES AND LEVEL CONTROLS . . . HEAT EXCHANGE EQUIPMENT . . . LEAD PLANT . . . and MISCELLANEOUS EQUIPMENT . . . Sale will take place . . .
- **THURSDAY, JULY 21, 1949, 11:00 A.M.**
- OFFERED as a complete operating plant to Bulk Bidders . . . and in Single Lots.
- TERMS: Cash or Certified Check, 25% deposit, balance on delivery. IMMEDIATE DELIVERY.
- SEND for Complete Inventory List to—

RALPH ROSEN ASSOCIATES
Auctioneers, Liquidators, Appraisers
909 Praetorian Bldg., Dallas, Texas
Phone Prospect 7-2148

EQUIPMENT FOR SALE

NATIONAL "50" Compound Double Drum Rig 128' Cantilever Ideco Mast, 10' substructure, 6,000' 4½" drill pipe, this rig complete and in excellent condition. P.O. Box 205 Sta. B, Bakersfield, California.

FOR SALE: 24-L Bucyrus-Erie Spudder, Reconditioned with dual pneumatic rear tires and trailer bracket, 40 ft. derrick, swabbing unit, power derrick hoist, Buda 6 cylinder engine. $4,500.00 Cash F.O.B. Princeton, Indiana. Randall-Zogg Supply Company.

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

COMBINED VAPOR SEPARATOR & FRACTIONATOR FOR THERMAL REFORMING

One (1) New 5'-6" ID x 61'-0" over-all height Bubble Tower made of 1¼" Plate and lined throughout with 5/64" and 7/64" thick, 11-13% Chrome stainless steel, type 405. Stainless steel support plates in place for 15 Trays, (Trays not included). Constructed in accordance with the API-ASME Code, stress relieved and radiographed. Designed for 400 PSI @ 750° F. Fabricated by A. O. Smith Corporation. Platform and ladder clips installed.

WOOD RIVER OIL & REFINING CO., INC.
335 West Lewis Street, Wichita, Kansas
Telephone 7-3325

LIQUIDATING GASOLINE PLANT SHIDLER, OKLAHOMA WILL QUOTE ATTRACTIVE PRICES!

Truscon Steel Buildings

Complete with structural Steel Framing, steel panels, steel windows and doors. Suitable for re-erection.

1—60-ft. x 186-ft. x 10-ft.
1—24-ft. x 36-ft. x 10-ft.
1—32-ft. x 30-ft. x 10-ft.
1—42-ft. x 20-ft. x 12-ft.
1—36-ft. x 44-ft. x 10-ft.

Pressure Vessels

1—Still, 6'9" x 35'9" x 1" shell, 200-lb. W.P. with steam coil.
7—Pressure Storage Tanks, 10'0" x 30'0" x ½" shell; 18,000-gallon capacity.
5—Pressure Storage Tanks, 7'0" x 30'0" x 7/16" shell; 8,800-gallon capacity.
9—Scrubber Tanks, 3'6" x 10'0" x ¾" shell.
2—Scrubber Tanks, 2'6" x 10'0" x 3/8" shell.
1—Storage Tank, 24'0" x 20'0" x 3/16" shell; 84,000-gallon capacity; riveted construction; open top.

Centrifugal and Reciprocating Pumps and Compressors — Pipe —Valves and Fittings

Write for complete list and quotations

Equipment may be inspected on the Gulf Jessie McComb lease, 1 mile west of Webb City, Oklahoma.

BROWN-STRAUSS CORP.
P.O. Box 78 Phone: L.D. 189
Kansas City 10, Mo.

EQUIPMENT FOR SALE

FOR SALE: Wilson Giant draw works, powered by 2—J.L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE: New 6-WAKU Waukesha motor complete. Twin Disc clutch, gas-gasoline carburetor. Never out of warehouse. $1,200 under list. $3,750 FOB Odessa. ARROW SUPPLY COMPANY, Odessa, Tex.

For Sale: Copyright 72601
THE ELECTRIC OIL HEATING UNIT
Heats oil to 222 Degrees
CLAUDE RAY JOHNSON
Willoughby Hotel Guymon, Oklahoma

FOR SALE: Practically new 70 B Brewster Drawworks equipped with G. M. Diesel 6 Motor & transmission, all friction clutches—automatic cathead. This drawworks has drilled 35,000 feet in shallow wells—being replaced by larger unit. Price $10,000.00 f.o.b. Salem, Illinois. Herman Graham Drilling Co., Box 176, Salem, Illinois. Phone 580.

FOR SALE—One hydraulic casing pulling machine, good condition, complete in every detail. Box C-975, The Oil and Gas Journal, Tulsa, Oklahoma.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

NEW 6⅝" O.D. API LINE PIPE

Seventy-three (73) Miles New 6⅝" O.D. 13# API Electric Weld Line Pipe, Plain End, Beveled for Welding, Regular Mill Coating, double random length Van Dyke Protectors Applied. Rock Island Oil & Refining Co., Inc., 335 West Lewis Street, Wichita, Kans. Telephone 7-3325.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

—FOR SALE—

PIPE

NEW, ELECTRIC-WELD

Immediate Delivery From Our Stock
Lengths Up to 40 Feet

2,500 Feet	—	7	x .272"
1,000 "	—	7⅝	x .365"
500 "	—	8⅝	x .500"
4,000 "	—	9⅝	x .352"
1,000 "	—	10¾	x .365"
5,000 "	—	12¾	x .250"
4,000 "	—	13⅜	x .380"
2,500 "	—	18	x .250"
1,500 "	—	20	x .250"
2,000 "	—	22	x .250"
10,000 "	—	24	x .250"
3,000 "	—	24	x .317"
5,000 "	—	26	x .312"

— ALSO —

SHEETS and PLATES

New—Large Quantity

All Prices Exceptionally Reasonable

WISCONSIN IRON & METAL COMPANY
N. 34th and W. Hopkins Streets
Milwaukee 9, Wisconsin
Hilltop 5-1500 — Hilltop 5-9480

EQUIPMENT FOR SALE

FOR SALE: 7400' 7" OD 20# used 10 V-Thread Lapweld Casing near Electra and Vernon, Texas. 1600' DITTO, near Walters, Oklahoma, 93 cents per foot. 2700' 24# DITTO $1.20 per foot, near Walters, Oklahoma. Cities Service Oil Company, Patridge, Bartelsville, Oklahoma.

FOR SALE at Oil Hill, Kansas: 2—80 HP Reeves 4 cylinder vertical gas engines, 9½" x 11", 300 RPM, Mfg. #8036-7. Empire Pipeline Co., Patridge, Bartlesville, Okla.

FOR SALE: One National Shot Hole Drill, solid kelly, Gardner-Denver pump, now working in West Texas. Also 500 gal. Dodge water truck. Box C-968, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE at Oil Hill, Kansas: 2—6" x 10" Worthington Deane Vertical Single Acting Triplex Used Pumps. Fig. No. 1654, Mfg. No. D88396 and 88400, maximum working pressure 425#, capacity 5270 BPD at 42 RPM. Empire Pipeline Co., H. D. Patridge, Bartlesville, Oklahoma.

FOR SALE: Rotary Mast Pole. 1—8" x 10" x 87' Two Leg Mast Pole with 5—24" Roller bearing sheaves in crown. 98'—¾" Raising Line and 110'—½" Telescope line. 1200'—9/16" Guywires and 160'—⅞" Guywire. 1—4000' Double Board. 1—30' Main Skid with upright supports for Mast and well for Rotary table. Denman Drilling Company, Phone 4553, Wichita Falls, Texas.

FOR SALE: 1 Model "K" Cardwell spudding unit powered by D-8800 Caterpillar Diesel motor, 1500 watt covered Kohler light plant on skids. Folding steel flaps for roof and walks, and canvas for inclosure. All steel dog house. Stems, bits, and bailers for 7-in. and 5-in. hole. Rod, tubing, and hand tools. Everything complete for immediate use. Shamrock Drilling Company, Great Bend, Kansas, Phone 5732, P.O. Box 322.

HOT OIL PUMPS AND COMPRESSOR

1—Worthington horizontal duplex reciprocating pump, enclosed frame, outside end packed plungers, forged steel fluid end, water cooled stuffing boxes, stainless steel valves and seats, size 10x3x10. 1—Clark engine and compressor, engine 80 H.P., size 16" x 15" x 7¼" x 20", 200 R.P.M., compressor intake pressure 0 lbs. discharge pressure 350 lbs., type Q compressor cylinders. 1—Worthington 4" x 18", 4-6 chrome block, horizontal, duplex, double plunger, enclosed frame hot oil fitted power pump, driven by Worthington 12½" x 14" horizontal, double acting steam engine with some spare parts for engine. 1—Worthington 5¼" x 18", 4-6 chrome block, horizontal, duplex, double plunger, enclosed frame, hot oil fitted power pump with some spare parts, driven by Worthington 12½" x 14" horizontal, double acting steam engine with some spare parts. Equipment second hand, in good condition; spare parts new. American Liberty Oil Company, Mt. Pleasant, Texas.

FOR SALE

CARDWELL MOBILHOIST complete with 5" drilling tools, new 4000' ¾" drilling line (run about 100 hours), good 5000' sand line, 4¾" dart bailor and Midco Sand Pump, circle, circle jack, tool wrenches, and dog house. Unit is powered by 6MZ Waukesha which has recently been overhauled. Equipped with practically new 8⅝" x 7" (reinforced with 5½") x 55' single pole mast. Spudding chain and lines have only been run about 50 hours. Unit is in good operating condition.

Price is $7,000.00.

CARDWELL MODEL H SINGLE DRUM SERVICING UNIT, powered by SRK Waukesha and equipped with 8⅝" x 7" (reinforced by 5½") x 55' three sheave single pole mast. Also has spudding attachment which is not mounted. Unit has just been mounted on a 2½-ton Diamond T Truck that has been completely overhauled.

Price is $4,000.00.

CLARKE OIL WELL SERVICING COMPANY
520 South Turner Telephone 27
Hobbs, New Mexico.

EQUIPMENT FOR SALE

4" FLANGED Gate Valves: New 4" Wheatley Standard 500# WP, 1000# Test, Semi-Steel, Bronze Trim, Rising Rack, Heavily Cosmolined Gate Valves with API Standard Series 300 Flanges (standard for 4" Flanged Connections of this pressure rating). Prices include 16 Flange Studs with Nuts and 2 sets asbestos gaskets in addition to valve. Money-back satisfaction guarantee.

25 to 50	$25.00	100 to 200	$17.00
50 to 100	20.00	200 to 500	15.00

Houston Equipment Company, Inc., 5513 Clinton Drive, Houston, Texas. Phone FArfax 2468 or PReston 9968.

MOBILE Core or Exploration Rotary Drilling Rig with capacity up to 3,000 feet. Fully equipped and with auxiliary trucks and trailers. Excellent condition. Phenomenal earning record. Now in operation on contract. Write or wire for full details. Box D-103, The Oil and Gas Journal, Tulsa, Okla.

EQUIPMENT WANTED

WANTED: One right-handed old style 40 hp. Reid gas engine cylinder. 410 Atlas Life Building, Phone 4-1569, Tulsa, Okla.

WANTED Franks used well servicing unit. Advise description, location and price. Box C-972, The Oil and Gas Journal, Tulsa, Okla.

WANTED: 4 single well pumping units for 4,500' wells. Box C-974, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED IMMEDIATELY

Jackknife derrick capable of handling not less than doubles. Also small portable rotary for 2500' drilling.

COMMERCIAL PETROLEUM CORPORATION

312 C. A. Johnson Bldg., Denver, Colo.

HELP WANTED

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipelines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipeline contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 29th Year).

PETROLEUM SALES: Midwest independent has opening for executive man experienced in bright stocks and neutrals sales. Excellent opportunity for right man. In replying, give full information, including age, education, experience, salary required. Replies held confidential. Box C-999, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEERS, Executives, Technical Men: Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection, will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 1204 Berger Bldg., Pittsburgh 19, Pa.

WANTED: Superintendent for combination natural gasoline and L.P.G. plant in Texas Gulf Coast area. Give record of past experience. Address Box C-990, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED MIDDLE EAST REPRESENTATIVE

An experienced oil-country representative to handle established Packing and Gasket line on commission basis in Middle East area. Well established company desires aggressive representation in Saudi Arabia, Iran, Iraq, Kuwait, etc.

BOX D-101

THE OIL AND GAS JOURNAL

TULSA, OKLAHOMA

HELP WANTED

SALES ASSISTANT—PETROLEUM PRODUCTS MARKETING: Young man who would be able after reasonable time necessary to familiarize himself with our operations and organization to take over top sales management job handling disposition of products of gasoline plants and a refinery. This is a challenging job with an active well-rated independent company in Texas, and the salary is open. Box D-100, The Oil and Gas Journal, Tulsa, Oklahoma.

ASSISTANT SALES MANAGER: Large Midwest independent needs young aggressive man with good experience in petroleum sales for position of assistant sales manager. Expanding operations require high-type executive for this permanent position. In replying, give full details including age, education, and salary required. Replies confidential. Box C-996, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST

Caracas, Venezuela

Senior man familiar with interpretations of seismic and gravity data and capable of independent review work. Minimum 5 years' commercial experience. Apply by letter stating education, experience and salary requirement to—

The Atlantic Refining Co.

RM. 900, 260 S. BROAD ST.
PHILADELPHIA, 1, PA.

WANTED
EXPERIENCED GAS LIFT ENGINEER

An opening for an experienced gas lift engineer and salesman. Knowledge of fluid weight and pressure differential type required. Reasonable salary commensurate with results. No commissions. Address with full information reply to

BOX C-984

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

INSTRUMENT ENGINEER

A major oil company has opening for Instrument Engineer with at least three years of chemical plant or refinery experience. Preference given to man with engineering background. Write Box C-989, The Oil and Gas Journal, Tulsa, Oklahoma, giving qualifications, education, experience, age, and attach a small inexpensive passport photograph.

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

CONSTRUCTION MAN

For 2-year project, with civil engineering and pipe line building experience, top references. Address Box C-981, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

YOUNG married man with pre-war B.S. degree in business and engineering from M.I.T., several years experience in finance and selling, also fully rated commercial pilot (including instrument) desires connection with independent oil operator in useful capacity with object of learning producing end of oil business. Box C-966, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL ENGINEER—27. B.S-M.S. in chemical engineering. Two years experience cost estimating, rating, designing heat transfer equipment. Desires position with progressive manufacturer or refinery where ability to assume engineering responsibilities can be demonstrated. Excellent references. Box C-995, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICIST: Young married man, five years experience, four years in Venezuela as computor, party chief, and central office interpreter; thoroughly experienced in both interpretation and crew management, desires position preferably with permanent location, either in U. S. or foreign. Opportunity to assume responsibility and to advance in position more important than salary. Write Box C-998, The Oil and Gas Journal, Tulsa, Oklahoma.

CANADIAN MANAGER AVAILABLE
Graduate Geologist and Petroleum Engineer, three years experience as manager production, Geology, Land and Natural Gasoline Plant western Canada; three years manager for major company Illinois and West Texas. Details and references upon request. Available 30 days. Box C-969, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM ENGINEER—One Good, Used Petroleum Engineer with 10 years experience in oil patch. Excellent references and available immediately. Write Fred E. Bryson, 325 Riverside Blvd., Abilene, Texas.

CHEMICAL Engineer B.S. in Ch.E. 4 years experience—design, instrumentation, initial operation—chemical processing plants. Mechanical engineering, business administration night courses. Member—A.C.S., A.I.Ch.E., I.S.A. Desire production or engineering. Box D-104, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

ALUMINUM PAINT—400 5-gallon cans, 480 quarts—Exterior Gilsonite Base, Highly Polished Pure Aluminum Pigment. Waterproof, ideal for tanks, roofs, buildings, equipment. Covers 300 to 400 square feet to the gallon. Distributors Liquidation. Regular price $6.95 gallon. Take any part—$10.00 for 5 gallons, $7 for 12 quarts. Send Check With Order. The National, 606 Walnut, Kansas City, Mo.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

SERVICES

25 YEARS' experience buying Oil Leases, Royalties, in Texas, New Mexico, Louisiana, Arkansas, Mississippi. Title work. Services available, salary, commission. A-1 references. Joe L. Ferguson, 115 Wildwood Drive East, San Antonio, Texas.

ESTABLISHED Petroleum Geologist and Draftsman Dallas office having tremendous amount Geological information Texas and surrounding states, subsurface maps kept up-to-date available for consulting basis. Box C-997, The Oil and Gas Journal, Tulsa, Oklahoma.

ROYALTIES WANTED

WANTED: Small proven oil producing royalties. Send full details first letter. Aztec Supply, 825 First Avenue, Rock Island, Illinois.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

CASH MARKET for PRODUCING ROYALTIES
ROBERT L. KINKAID
World Bldg. Tulsa, Oklahoma

LEASE AND DRILLING BLOCKS

FOR SALE: Ohio 750′ Berea leases, 13 wells, 6 bbls. natural, proven locations to be drilled. Inexpensive. E. N. Rehler, Allegany, N. Y.

FOR SALE: Southeastern New Mexico Oil Leases and Royalties Lea, Chaves and Curry Counties. Raulie Bros., 308 East 2nd St., Clovis, New Mexico.

OIL LEASE: 110 acres, Montgomery County, Kans. NE¼ of SE¼ and NW¼ of SE¼ and lots 7 & 8, all in Sec. 1, T-35, R-16 E. Preu 310′, Squirrel 532′. Bartlesville 660′. Wilcox 1200′. Producing squirrel sand only. 5 wells 15 bbls. Ideal, economical, repressuring project. Price $20,000. Full particulars, M. J. Regan, Coffeyville, Kans.

OIL LEASES for sale in large, small or medium size blocks in Colorado, Wyoming, New Mexico, Montana, Arizona. Wholesale or retail. Write for descriptive list. Dyer-OJ, 1835 Champa, Denver, Colorado.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

FOR LEASE for oil and gas—acreage in Brazoria County near Angleton, Texas. Write E. Hufford, Box 633, Boulder City, Nevada.

WE BUY Salvage Oil Properties and small production. Ben H. Rosenthal, 1901 Republic Bank Bldg., Dallas, Texas.

OIL and wet gas expansion and development practically unlimited in most all East Texas. Let us help with one, checkered, or a block of leases, also mineral rights and land. We have had 30 years' constant contact in this area, and know of many favorable localities. Box C-987, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

ATTENTION
OIL AND GAS OPERATORS

We own and control large block leases in Southwestern Wyoming recommended by two eminent petroleum engineers to be the greatest potential gas and oil fields in Rocky Mountain area. We offset sand production having produced to date over 12,000 bbls. per acre at about 1,200 feet. Gas wells have been drilled on and adjacent to our property with estimated capacities as high as 100 million feet per day at shallow depths. Accurate and current geology available including seismograph, core drilling, electric log data. Oil pipe line facilities present and excellent market for gas now a reality. Prolific deeper pays reported assured. Put your idle rigs to work or join us in developing this great field. Immediate action imperative for liberal deals.

Box D-102, The Oil and Gas Journal, Tulsa, Oklahoma

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908 Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 118 South Cincinnati, Tulsa 3, Oklahoma.

EQUIPMENT MEN

(Continued from page 155)

Cunningham, assistant in the industrial department of the Chamber of Commerce, secretary.

Waddell Elected Vice President of N.I.A.A.

M. R. WADDELL

Milford R. Waddell, industrial and public relations director for Black, Sivalls & Bryson, Inc., was elected a vice president of the National Industrial Advertisers Association at the annual convention held in Buffalo. He was also appointed membership chairman for the coming year.

As vice president, Waddell will represent the Central Middle West on the executive board of N.I.A.A., the oldest and largest group of advertisers in the United States. Bernard Doland of Peter A. Frassee & Co. of New York City was elected president for 1949-50. Waddell was a charter member and first president of the Kansas City chapter of N.I.A.A., organized in 1948, and for the second successive year he has been elected to represent the chapter on the national board of directors.

McCullough Announces Canadian Service Branch

McCullough Tool Co., Los Angeles, has announced the opening of its first Canadian service branch at Edmonton, Alta. The new branch is under the managership of Norman Brookes who is assisted by two experienced service engineers, Verl J. Sanders and Stan Hendrickson. Brookes has been with McCullough for over 11 years and previously was in charge of the Bakersfield, Calif., office. All the regular McCullough services are now available in Canada.

I. J. McCullough, president of McCullough Tool, has also announced the appointment of William R. Wiley as sales engineer, operating out of the McCullough Los Angeles headquarters. Wiley, for the past 8 years sales engineer for Emsco Derrick & Equipment Co., has taken the place of Lloyd A. Calhoun who recently became general sales manager of Sweet Oil Well Equipment, Hobbs, N. M.

Sterling Adds Whitson and Perryman to Sales Staff

LEO WHITSON

L. D. PERRYMAN

Sterling Packing & Gasket Co., Houston, has announced the addition of two sales engineers to its sales staff. Leo E. Whitson will be stationed in the Houston office, and will devote his time and efforts to the packing and gasket requirements of the drilling phase of the industry on the Texas Gulf Coast.

L. D. Perryman will represent Sterling in South Louisiana, working out of Lafayette. Prior to becoming a Sterling sales engineer, Perryman was sales representative for Cameron Iron Works for 5 years in southern Louisiana, followed by 2 years of sales work with the W.K.M. Co.

Eagerton Made Nordberg Vice President

B. T. EAGERTON

Appointment of B. T. Eagerton to the position of vice president in charge of the export division of Nordberg Manufacturing Co. has been announced by R. E. Friend, president. Eagerton joined Cleveland Tractor Co. in 1928. He was export sales manager of that company and when it was merged with Oliver Corp. he became assistant manager of the export division of Oliver. He has been export manager of Nordberg since leaving Oliver in 1946.

Whessoe to Manufacture S & J Products in England

Shand & Jurs Co., Berkeley, Calif., has completed license arrangements with Whessoe, Ltd., of Darlington, England, for the manufacture of S & J products in that country. Whessoe was founded in 1790 and is one of the largest manufacturers of storage tanks and other petroleum and chemical-industry vessels outside of the United States.

The addition of the Shand & Jurs line of specially designed valves, gages, and other safety and conservation equipment used with such tanks and vessels, will complement the firm's activity in that field.

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Rocky Mountain

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cu. ft. of gas daily with an ungaged amount of distillate.

WYOMING SUCCESSFUL WILDCATS

Lake Creek, Hot Springs County: Barnsdall Oil Co. 1 Unit, C SW NE 14-43n-92w, flowed 114 bbl. of 31°-gravity oil per day, TD 3,796 ft., Mowry 661 ft., Mouddy 1,149 ft., Dakota 1,424 ft., Morrison 1,570 ft., Sundance 1,784 ft., Gypsum Springs 2,127 ft., Chugwater 2,170 ft., Dinwoody 3,291 ft., Embar 3,330 ft., Tensleep 3,543 ft.

Sussex, Johnson County: Continental Oil Co. 4 Unit, NW SW NW 17-42n-78w, 240 bbl. per day, TD 7,867 ft., Shannon 4,550 ft., second Wall Creek 6,810 ft., Lakota 7,787 ft.

Hay Creek, Weston County: Schlaijker Bros. 1 Sterling, C NE SW 33-46n-66w, pumped 55 bbl. per day, TD 6,446 ft., Newcastle 6,190 ft., Dakota 6,402 ft.

WYOMING WILDCAT FAILURES

Lightning Creek, Niobrara County: Atlantic Refining Co. 1 Cook, C SW NE 6-34n-65w, dry, TD 1,265 ft., Muddy 1,200 ft., Muddy sand 1,202-52 ft.

Grayrocks, Platte County: General Petroleum Corp. 84-2-P, SE SE NE 2-24n-66w, dry, TD 2,301 ft., Benton shale 1,235 ft., Cloverly 1,875 ft., Morrison 1,961 ft., Sundance 2,133 ft.

Lodgepole, Weston County: Bay Petroleum and M. E. Morton 1 Brown, C SW SW 2-44n-67w, dry, TD 7,270 ft., Newcastle 6,991 ft.

COLORADO WILDCAT FAILURES

Tepee Buttes, Crowley County: Gulf and Colorado Fuel & Iron 1 Unit, SE SE NW 36-18s-56w, dry, TD 7,178 ft., Niobrara 845 ft., Timpas 1,496 ft., Carlisle 1,538 ft., Greenhorn 1,750 ft., Graneros 1,855 ft., Dakota 1,970 ft., Purgatoire 2,120 ft., Cheyenne 2,220 ft., Morrison 2,245 ft., Sundance 2,465 ft., Dockum 2,550 ft., Quartermaster 2,617 ft., Day Creek 2,900 ft., White Horse 2,960 ft., Blaine 3,095 ft., Flower Pot 3,135 ft., Cedar Hills 3,160 ft., Harper 3,358 ft., Pennsylvanian 4,633 ft., Mississippian 6,828 ft., Arbuckle 7,049 ft.

Tercio, Las Animas County: Skelly Oil Co. 1 Colorado Fuel & Iron, NE NE NW 29-34s-68w, dry, TD 7,457 ft., Timpas 880 ft., Greenhorn 1,070 ft., Dakota 1,270 ft., Permian 2,065 ft.

Towaoc, Montezuma County: E. G. Goldsworthy 2 Porter, C N/2 SE 1-34n-17w, suspended, TD 4,075 ft., Dakota 912 ft., Shinarump 3,620 ft.

MONTANA WILDCAT FAILURE

Virgelle structure, Chouteau County:- Marena-York 1 Fultz, NE SW SW 8-25n-12e, dry, TD 2,910 ft., Kootenai 2,247 ft., Sunburst 2,545 ft., Ellis-Madison 2,835 ft.

CALENDAR

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Gas Association, annual convention, Chicago, September 17-20.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 18-20.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 28-30.

October

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

NOMADS

Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

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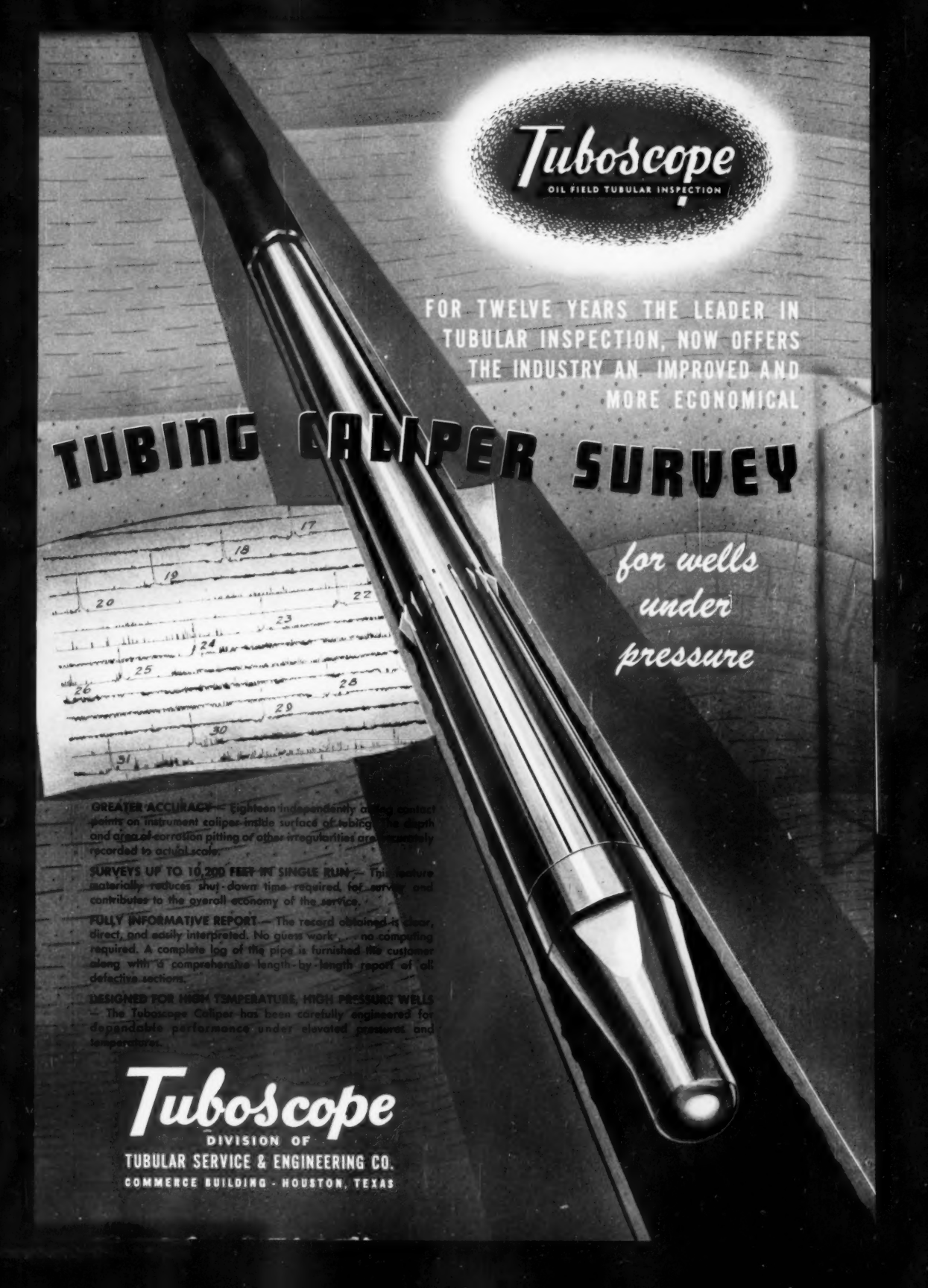
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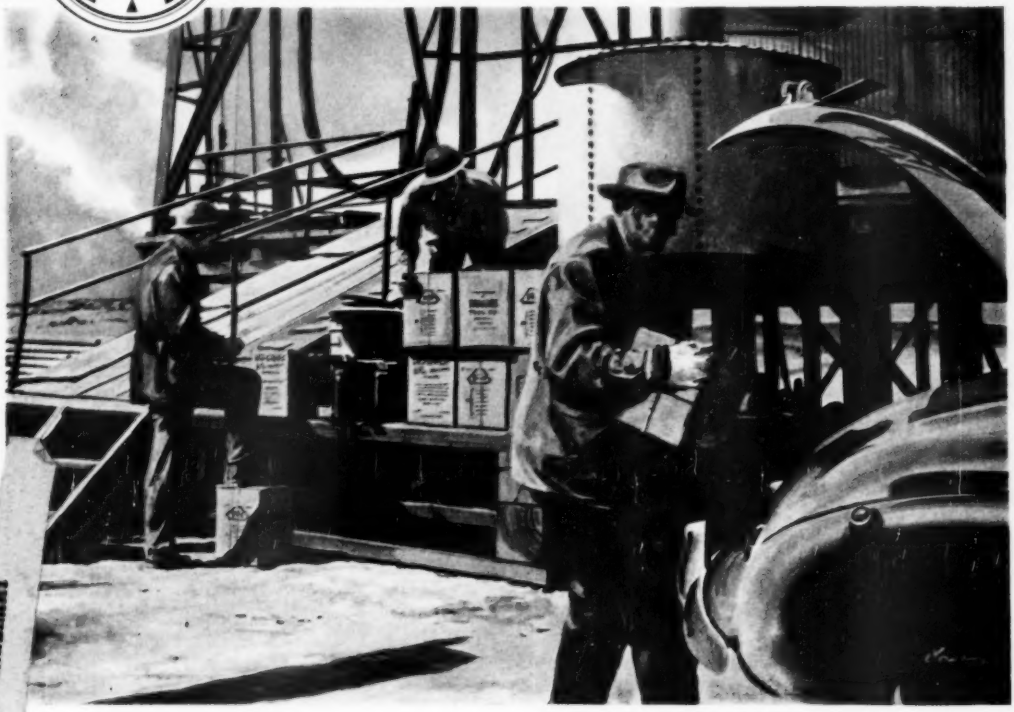

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